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from your president

On Friday, October 13 from 3:00 p.m. to 5:00 p.m. in the Bellevue-Stratford Hotel, The American Academy of Pedodontics will host the members of ASDC at an essay program. The meeting will consist of an essay on "Recent Advances in Pediatrics." This joint meeting that is held on the odd numbered years when the Academy meets in conjunction with ASDC and the ADA has helped to strengthen the fine relationship that exists between the two organizations.

* * *

Summer is upon us and those of you who have not made your reservations for the National Meeting of ASDC—October 13-15—Philadelphia, please give this your immediate attention. We need you and you will enjoy the fine informative program and glorious entertainment that has been prepared for you.

* * *

The Special Public Relations Committee has done much work toward developing a presentation for a public information/public relations program that may be accepted by the executive council and the House of Delegates. This committee has formulated several serious questions that need answers from the State Units, e.g.

Do the State Units desire any assistance from ASDC in the area of Public Relations?

What specific Public Relations problems do the State Units have?

Do the State Units desire any assistance in the field of public information?

These questions and many others need answers before ASDC can develop a formal program of this type. It would be of great assistance to your executive council if you would discuss the above questions and send in a short report following your next State Unit meeting to Doctor Frank Tuma, 7701 Fitzwater Road, Cleveland 41, Ohio.

JAMES H. SIMMONS

Correction of Class II Malocclusion With Open Bite In the Primary Dentition: Case Report

LOUIS B. KELSTEN, D.D.S.

Epitome

Dento-facial malformations caused by adverse oral habits which later may require long and complicated orthodontic procedures, can be quickly corrected by early simple treatment in the primary dentition. Provided, before the use of the habit-breaking appliance and swallowing exercises, understanding and cooperation are promised not only by the child but also by the parents.

ON May 6, 1957, a physician and his wife brought their son, who had a gross dento-facial malformation, to my office for orthodontic consultation. According to the history, the boy, age 4, sucked his lower lip and this habit not only had created a severe deformity but seemed to affect adversely the psychologic well-being of the child, even though much effort and time had gone into attempting to eliminate the habit. As the mother expressed it, finally she couldn't "stand the sight of the child nor his withdrawn behavior pattern." (Figures 1 and 2)

FIGURES 1 and 2. Front and profile photographs of child taken before use of appliance. Note lower lip and withdrawn expression.

The boy's occlusion revealed a pronounced open bite and a Class II, Division I (Angle) malocclusion of the primary dentition. (See Figure 3) During the consultation, I told the parents that an attempt would be made to correct the child's lip sucking habit by means of a lower appliance with spurs which would prevent the lower lip from slipping under the upper teeth. However, it was imperative that they as well as the child understand and accept certain hazards connected with this appliance. They were told that after its insertion, the boy would be extremely uncomfortable for several days until he learned not to place his lower lip behind his upper teeth. The parents, eager to help the child, readily consented to the appliance.

That same morning records such as study models and intra-oral and profile

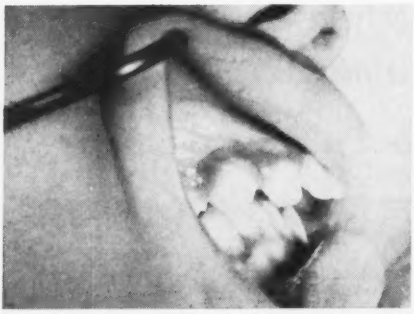

FIGURE 3. Profile photograph of child's dentition before use of appliance.

x-rays were made. The following week, two lower first primary molar bands were made to which a labial wire of .030 inch thickness was soldered with three spurs projecting labially. (See Figure 4) While

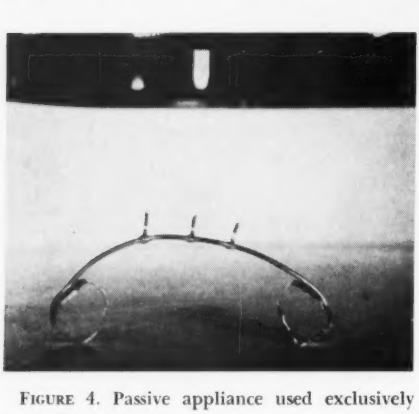

FIGURE 4. Passive appliance used exclusively in treating the case.

the appliance was being fabricated, the youngster was carefully told what to anticipate; moreover, it was explained that the appliance was not being placed in his mouth to punish him but to remind him not to suck his lower lip. This, he was told, would make his teeth and face "look nice" so that he would be more liked by his friends. Cheerfully, he seemed to accept the fabricating procedure as well as the appliance when it was cemented into position. (See Figure 5)

A few days later, the boy was brought back to the office for observation. Although his lower lip was bruised, he had stopped sucking it completely. Naturally, the parents were pleased with the initial progress. At the next appointment, the youngster was given proper swallowing exercises: he was taught to

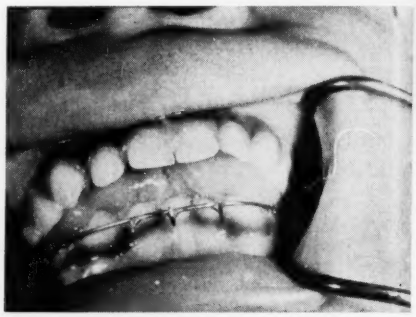

FIGURE 5. Appliance cemented in the child's mouth. Note open bite in centric occlusion.

swallow in the back part of his mouth with the tip of his tongue a half inch behind the upper incisors against the hard palate and with upper and lower molars together in centric occlusion. These exercises, under his mother's supervision, were performed daily for 15 minutes. Also, he was instructed to swallow properly whenever he happened to think about it.

After seeing the child at monthly intervals, about four months later on September 5, 1957, the open bite and Class II malocclusion had changed to almost a normal occlusion. Also, the boy's behavior pattern had become more sociable; he was more friendly and talkative and less inclined to play by himself. At this time the lower appliance was removed.

On June 5, 1958, the child was seen again. Figure 6 reveals the occlusion even further improved. (Note the congenitally missing lower right primary central.)

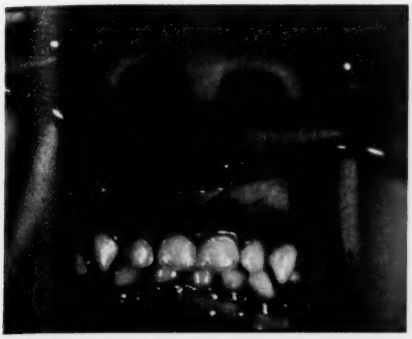

FIGURE 6. Child's mouth a year following treatment. The lower right primary central is congenitally missing; note the improved occlusion.

Over two years after removal of the appliance, on September 19, 1959, there has been no relapse in the habit and there is a marked improvement in the child's dento-facial development. (See Figures 7 and 8) However, due to the congenitally missing lower incisor and the possibility of occlusal discrepancies that might occur during transition from the primary into the mixed and permanent dentition periods, the parents have been advised to bring the youngster back for periodic orthodontic examination.

FIGURES 7 and 8. Profile and full face photographs of child two years following removal of lower appliance.

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Ephebology—Ephebiatrics—Ephebodontics

HOWARD W. REDMAN, D.D.S.

Introduction

PROGRESS in the health sciences has resulted in the delineation of fields and the development of specialties in these fields. Medicine has been the natural leader in this subdivision process, and in the last few decades, internal medicine, urology, pediatrics, gynecology, geriatrics, and others have become common terms to the laymen. Now another field in medicine is raising its infant head, ephebiatrics. Ephebology, from which the previous word originated, is defined as the study of puberty. In dentistry, a comparable field soon will begin to develop, and to it we shall ascribe the name Ephebodontics.

Recognition of a Need

Pediatricians provide for the medical care of children to the approximate age of twelve. Thereafter, the child is placed in the hands of the family physician, be he general practitioner or internist. At this point the link of medical care is often broken, and the growing child sees a physician only when he is ill. The adolescent has not been neglected, but he has not had the special attention which those older or younger than he have had. These young people, between the ages of twelve and twenty, are at focal points in their physical and emotional development, and the care they receive during this age can make a tremendous difference.

This same problem exists in dentistry; however, because of the dental caries problem in this age group and the need for orthodontics, the adolescent has received a greater concentration of effort in dentistry. And it must be recognized that the effort is increasing. Nevertheless, a greater understanding and improved management of the over-all dental problems of the adolescent age group and their correlation with medical and emotional problems is definitely indicated.

Ephebiatrics Is Started

The delineation of ephebiatrics as a clinical science has materialized in two places in the United States, according to information the writer has. The Adolescent Unit in the Children's Medical Center, Boston, Massachusetts, has outpatient and hospital service and also trains physicians in the care of this age group.[1] The Permanente Medical Group in Oakland, California, established their Teenage Clinic in 1953.[2] Both are doing outstanding performances, indicated by the steady monthly increase of patients handled.

The Adolescent Unit in Boston was started in 1951, and its present director is J. Roswell Gallagher, M.D. It was established to serve a four-fold purpose: 1. To offer young people from twelve to twenty-one medical care in their own out-patient clinic and by their own physicians. 2. To focus the effort to research workers upon disorders which occur in adolescence so that methods of preventing, diagnosing, and treating them may be improved. 3. To furnish physicians with opportunities for training in understanding both adolescents and their medical and emotional problems. 4. To offer to physicians, training in the care

of a person who is a member of an age group as a supplement to training focused on diseases or a specialty.[3]

The Teen-age Clinic in Oakland is a part of the prepaid health insurance program at the Kaiser Foundation Medical Center, and its director is Arthur Roth, M.D. Its purpose is to maintain the patient contact which the physician has established. Leaving the pediatrician, the patient sees the teen-age doctor, and no void of medical care exists.[4]

Need in Dentistry

The need for a concentrated approach to the adolescent problem in dentistry and more especially a team approach with medicine is obvious. In today's pedodontic teaching and practicing, the thoroughness of planning and treatment has become an accepted procedure. Teamwork between the dentist and physician in handling the special problems of the growing child does exist. A classic example is the Cleft Palate Center at the University of Illinois. Here the team consists of pediatrician, pedodontist, surgeon, orthodontist, prosthodontist, speech therapist, psychologist, and social worker. Each specialist examines the child and reports his findings. Then a group consultation is held, and the treatment plan is outlined for the child. So the child under twelve years of age has available the thorough care he needs.

However, have you ever seen a sixteen-year-old diabetic sit in the reception room of a pediatric hospital clinic? Have you observed his uneasiness and awkward embarrassment? Have you watched a young adolescent in the reception room of a pedodontist as he sits next to children eight and nine years old? Have you noticed the number of twelve-year-olds who do not want to sit in the small dental chairs any more? Dentistry needs the man who will continue the care of the child from age twelve to eighteen or twenty. Dentistry needs the man who will develop the skills and special knowledge to treat the problems of the adolescent group. Dentistry needs the man who will treat, in the adolescent, the rampant caries case, the major accident case, the emotionally disturbed youngster, the diabetic, the handicapped, the hospital anesthesia case, and the many other special problems in this age group. Dentistry needs the man who will concentrate his time on these problems, consulting with other specialists, and referring patients to specialists where it is indicated; acting to treat the dental problems of the adolescent as an integral part of his over-all problem. Dentistry needs an ephebodontist.

Summary

The pediatrician and the pedodontist provide for the care of children to the age of twelve. After this age, there is a void. Recognizing this void in medicine, two outstanding medical men have developed adolescent clinics. The need for special care of adolescents exists in dentistry. [*Editor's note: A Section on Dentistry for the Adolescent has been in operation at the University of Detroit School of Dentistry since September 1960.*]

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Rockford, Ill.

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2. Roth, Arthur, M.D.: Teenagers as Patients, California M, 89(6) Dec. 58, p. 402-5.
3. The Adolescent Unit of the Children's Hospital, Children's Medical Center, Boston, Massachusetts, pamphlet.
4. Roth, Arthur, M.D.: *Ibid.*

An Evaluation of the Oblique Cephalometric Film*

THOMAS K. BARBER, D.D.S., M.S.,[1] SAMUEL PRUZANSKY, D.D.S., M.S.,[2] AND RONALD KINDELSPERGER, D.D.S.[3]

THE dental profession's appreciation of the growth and development of the head is, in great measure, a by-product of roentgenographic cephalometric research. This area of investigation has been dominated largely by orthodontists, anthropometrists and other investigators outside of the dental profession. To the pedodontist, whose concern for the growth of the jaws and eruption of the teeth is second to none, the opportunities in roentgenographic cephalometry offer an exciting challenge for useful investigation.

I. INTRODUCTION

In pursuit of this opportunity, this report is concerned with the extension of the technic of cephalometry to the special problems that concern the pedodontist. Specifically, this report is the result of a detailed effort to evaluate the validity of measurements from the oblique cephalometric film in order that this roentgenograph may be applied in pedodontic research.

What Is the Oblique Film?

In a previous paper,[2] a detailed discussion of the several cephalometric projections commonly employed was submitted. Since a detailed review of cephalometric principles and technics would be redundant, reference should be made to previous publications and to related reviews.[1, 3, 4, 5, 6, 7, 8, 9, 10]

Briefly, the oriented oblique cephalometric film is obtained by rotating the head-holder independent of the cassette so that the mid-sagittal plane of the head

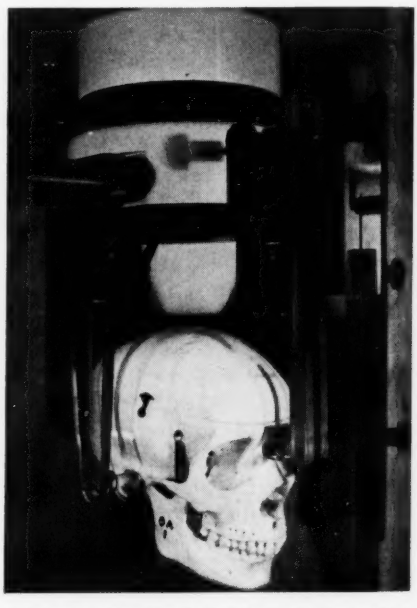

FIGURE 1. Human skull oriented to Frankfort position in the head-holder and rotated to 45° of the central-axis x-ray and the cassette.

is at a 45° angle to the cassette (Figure 1). Thus, the cassette remains in its standardized perpendicular relation to the x-ray source. The head position is maintained in the Frankfort horizontal

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[3] Research Assistant in Pedodontics, University of Illinois, College of Dentistry.

plane for the oblique as for the more conventional lateral and frontal projections.

The oblique projection was introduced into the literature by Cartwright and Harvold,[6] and employed by Posen[9] as a means of measuring the vertical height of the body of the mandible.

Posen[9] summarized the advantages of the oblique film in the following passage:

"The standard technique employed in roentgenographic cephalometry calls for a positioning of the head in such a manner that the central axis ray passes along the right and left earposts and is, thus, perpendicular to the midsagittal plane of the head and the film surface. The shadows of the right and left sides are thus superimposed. With a postero-anterior film taken at right angles to the lateral film, it is possible to separate the right and left images by projection for qualitative comparison. An accurate quantitative differentiation is almost impossible, however, for the reason that the side of the jaw closer to the anode, casts a larger image than that further away and closer to the film.

"To surmount some of the difficulties presented by superpositioning in standard cephalometric roentgenology, it has become accepted technique to bisect differences between the two images and measure the resulting dimensions against the image of a leaded aluminum millimeter scale, placed in the sagittal plane when the lateral exposure is made. In this manner, bilateral structures are reduced to the values of single midline structures, the dimensions of which represent the mean of the two.

"The present study necessitated the use of a method that would permit either a determination of absolute size or an equal size distortion of both sides for the purpose of comparison. It was thought that this might be accomplished and superpositioning avoided at the same time by making separate exposures of the left and right sides with the head rotated to bring the lateral surface of the mandible more nearly parallel to the film. Tests with dried skulls indicated that this could best be accomplished with rotatings of 45° to the right and left. . . ."

How Reliable Are Measurements Obtained From the Oblique Film?

If the oblique film is to be employed in measuring the size of teeth, length of arch, and rates of eruption, it first must be established that such measurements are reliable. Obviously, the way to test such reliability is to select given points on several skulls, measure them on the skull and compare these measurements with the same measurement of the projected film-image.

Posen[9] measured landmarks, essential to his study, on a dried skull and compared these measurements with similar ones made on the film. He found a difference of 0.5 mm. in anterior, central and posterior enlargement of vertical height. In a later report, Hatton and Grainger,[7] in their survey of the reliability of cephalometric measurements, stated that measurements on the oblique film were valid, but they reported no substantiating data.

For these reasons, it was felt that a more exhaustive evaluation of the distortion and enlargement by the oblique projection had to be made before this method could be employed with confidence.

II. METHODOLOGY

A. Materials

Ten skulls were selected at random with the following range in age based upon estimates from the dentitions: 1 yr., 3 yrs., 5 yrs., 6 yrs., 7 yrs., 10 yrs., 12 yrs., and three adult skulls. Disks of orthodontic silver solder, measuring 0.030 inches in diameter were cemented to 11 sites on each side of the mandible, and to eight positions on each side of the maxillae (Figure 2). The radiopaque disks provided identifiable spots on the x-ray film and points to serve as sources for direct measurement on the

FIGURE 2. Human skull showing the maxillary and mandibular sites of placement of orthodontic silver solder disks 0.030 inches in diameter.

skulls. The disks were cemented in the following pattern:

1. Disks were placed on the tips of the cusps of the following teeth:

Maxillae	6, 5, 4, 3
Mandible	6, 5, 4, 3, 2

2. Additional disks were placed along the lower border of the mandible directly below the corresponding disks placed on the tips of cusps with the additional placement of a disk at the midline, one at the mandibular angle, and one at the center of the lateral surface of the condyle.

3. Other disks were placed arbitrarily at what might correspond to the maxillary base superior to the apices of the roots of each of the buccal teeth that carried disks at the tips of the cusps.

B. X-ray Equipment

Target Source: A standard dental x-ray unit (G.E. 90-II) was used which would allow adjustment in milliamperage and kilovoltage. The tube-head was fixed in relation to the head-holder at the standard distance of five feet from the target to the mid-sagittal plane.

The head-positioner utilized the accepted standards for roentgenographic cephalometry for lateral and antero-posterior views. In addition, the head-positioner could be rotated to any horizontal angle in relation to the cassette in order to obtain oriented oblique views. There were fixed stops at each 45° position of the total 360° of rotation.

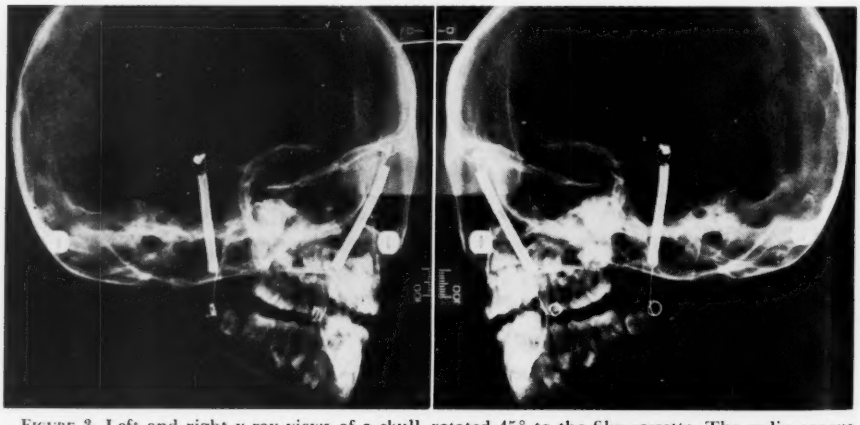

FIGURE 3. Left and right x-ray views of a skull rotated 45° to the film-cassette. The radio-opaque disks of silver solder are visible along the tips of the cusps and bases of the maxilla and mandible.

A 45° oblique film was exposed of the right and left sides of each properly oriented skull (Figure 3).

Exposure: The film used was Kodak Blue Brand, 8 x 10″, in metallic cassettes with dual par speed intensifying-screens. The films were exposed for 1/15 second at 10 ma. and 90 kv.

C. Measurement

Each measurement cited in the findings was made with a vernier calibrated caliper to an accuracy of 0.1 mm. by placing the tips of the caliper at the center of the 0.030″ disks of solder. A total of 12 measurements were made on each half of the maxillae and a total of 14 measurements were made on each half of the mandible. The corresponding measurements were made on the film for comparison.

III. FINDINGS

Initially, the measurements of both the right and the left sides for the skull and film-images were tabulated separately. Visual inspection of these measurements suggested that each side was, in actuality, part of a similar sample. Consequently, the "t" test was applied to several of the individual areas of measurement. No significant difference in the measurements was found between the right and left projections. Consequently, the individual measurements were listed together and provided a sample of 20 oblique views (10 right and 10 left) of both the maxilla and mandible.

The separate measurements obtained from the skulls were totalled and the same measurements obtained from the film were totalled. The difference between the measurements on the skull and film was calculated as a percentage of the measurement of the skull. This difference became a "plus" value if the film-image were larger than the direct measurement of the skull. On the other hand, if the film-image were smaller the percentage was expressed as a "minus" value. Since future experimentation will be concerned with measurements obtained from film-images each per cent of difference in this report will be expressed as larger on film (Lof), if it is a plus percentage, and smaller on film (Sof) if the relation is a negative percentage.

A. Differences Between Skulls of Varying Ages

Since the skulls varied in age from one year through adulthood it was necessary to determine whether the differences in the size and shape of the skulls at several age-levels would contribute to differences in enlargement-distortion. Tables I and II reflect the range of difference in millimeters between the film and skull-measurements for each of the separate determinations. The smallest difference is compared with the largest difference in the skull-film measurements, thereby showing the range of difference between the two.

Since the enlargement-distortion was not significantly different between the various sizes of skulls, it seems reasonable to assume that a single table of such factors, limited at least to the measurements reported herein, is equally applicable to all age-groups. For the same reason, all of the comparative measurements reported were treated as if they originated in a homogenous sample.

As a further test of the validity of this conclusion, the correctional data later developed were reapplied in the follow-

TABLE I

Enlargement-Distortion Range
45° Cephalometric Film
Mandible

Area	*Skull to Film Variation Per Cent*	*Range (mm.)*
Ang.-Condyle	5.15 Lof	+2.0/+3.5
6 to Base	3.48 Lof	+0.3/+1.2
5 to Base	2.36 Lof	−0.2/+1.2
4 to Base	1.22 Lof	−0.6/+1.1
3 to Base	0.64 Lof	−1.4/+0.7
6 to 5 (cusps)	3.20 Sof	−1.1/+0.3
5 to 4 (cusps)	1.20 Sof	−0.9/+0.3
4 to 3 (cusps)	1.31 Sof	−0.7/+0.3
6 to 3 (cusps)	2.19 Sof	−1.5/+0.4
6 to 5 (base)	3.20 Lof	+0.1/+0.7
5 to 4 (base)	3.60 Lof	+0.0/+0.6
4 to 3 (base)	3.63 Lof	−0.1/+0.4
6 to 3 (base)	4.17 Lof	+0.5/+1.6
Angle to Midline	4.03 Lof	+0.9/+3.2

Lof = Larger on film. Sof = Smaller on film.
+ Values = Larger on film.
− Values = Smaller on film.

Range of mandibular distortion and enlargement in measurements on film as related to the skull. The smallest range (0.5 mm.) can be seen from 5-3 along the base of the mandible while the greatest range (2.3 mm.) occurred from the angle to the midline.

ing manner. Measurements were made on the films of all of the skulls, and then, by applying the correctional factors, the direct measurements on the skull were predicted. The predicted measurements correlated to the direct measurements within hundredths of a millimeter in most measurements and varied no more than 0.3 mm. in any measurement.

The smallest range of differences in measurement (0.5 mm.) of the mandible existed when measuring from first primary molar to canine along the base of the mandible (Table I).

In a like manner, the greatest range of measurement for the mandible (2.3 mm.) occurred from the angle to the midline (Table I).

The smallest maxillary range of measurement was 0.7 mm., seen when measuring from the canine or first primary molar to the base of the maxillae (Table II). The greatest maxillary range (3.3 mm.) occurred when measuring across the base of the maxillae from first permanent molar to second primary molar.

B. Mandible

A profile view of the mandible is shown in Figure 4, with the location of the disks of silver solder connected by

TABLE II

Enlargement-Distortion Range
45° Cephalometric Film
Maxillae

Area	*Skull to Film Variation Per Cent*	*Range (mm.)*
6 to Base	1.31 Sof	−0.8/+0.7
5 to Base	0.41 Lof	−1.8/+0.8
4 to Base	3.0 Lof	+0.0/+0.7
3 to Base	3.17 Lof	+0.1/+0.8
6 to 5 (cusps)	7.93 Sof	−1.6/+0.2
5 to 4 (cusps)	4.11 Sof	−1.8/+0.4
4 to 3 (cusps)	0.50 Lof	−0.8/+0.3
6 to 3 (cusps)	3.06 Sof	−1.9/+1.2
6 to 5 Base	5.25 Sof	−2.8/+0.5
5 to 4 Base	0.85 Lof	−0.8/+0.3
4 to 3 Base	1.62 Lof	−0.2/+0.3
6 to 3 Base	0.55 Lof	−1.6/+0.8

Lof = Larger on film. Sof = Smaller on film.
+ Values = Larger on film.
− Values = Smaller on film.

Range of maxillary distortion and enlargement to measurements from films as related to the skull. The smallest range (0.7 mm.) is visualized from 3 to base, or 4 to the base of the maxillae. The greatest range (3.3 mm.) was observed when measuring from 6-5 across the maxillary base.

solid lines, each designating a separate linear measurement.

Vertical Dimension: The measurements obtained from the condyle to mandibular angle (A, Figure 4) showed the film-image to be 5.15 per cent larger than the corresponding measurement from the skull. At the same time the measurement between the tip of the cusp of the canine to the base of the mandible was but 0.64 per cent larger on the film (E, Figure 4). The percentage of enlargement of the film-image steadily decreased from posterior to anterior (A to E, Figure 4).

Horizontal Dimension: Horizontal measurements obtained from tooth to tooth at the occlusal level showed the film-image generally to be smaller than the corresponding measurements on the skull (F, Figure 4, first permanent molar to second primary molar, to H, Figure 4, first primary molar to canine).

Similar horizontal measurements of the lower border of the mandible showed this area to be larger on the film-image than the measurement on the skull. The degree of enlargement increased from 3.2 per cent, when measuring from first permanent molar to sec-

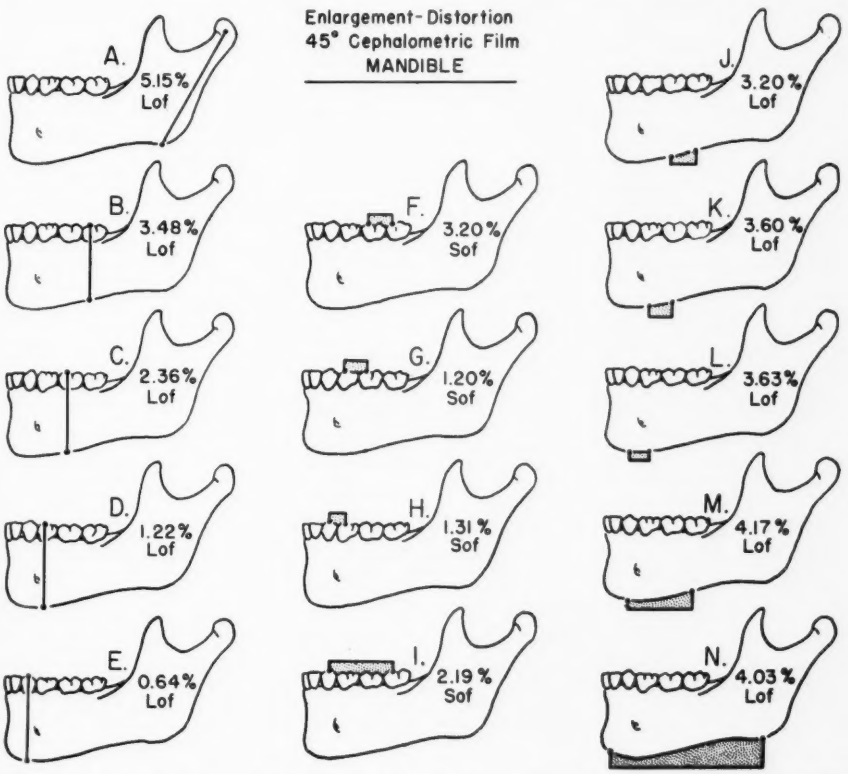

FIGURE 4. Mandibular schema illustrating 14 areas of measurement on the x-ray film and their respective percentage of distortion and enlargement relative to the same measurement directly from skulls. Lof = larger on film. Sof = smaller on film.

ond primary molar (J, Figure 4), to 3.6 per cent when measuring from first permanent molar to the canine (L, Figure 4). The over-all enlargement of points on the lower border of the mandible, extending from first permanent molar to canine, was 4.17 per cent (M, Figure 4). However, the lower border, when measured from mandibular angle to mid-line, revealed a somewhat lesser enlargement on the film of 4.03 per cent (N, Figure 4).

C. Maxilla

Figure 5 displays a view in profile of one-half of the maxilla with the locations of the disks of silver solder and the solid lines designating separate linear measurements similar to those of the mandible.

Vertical Dimension: Measurements obtained from the maxillary base to the tips of the cusps of the first permanent molar showed the measurement on the film to be 1.31 per cent smaller than the bony measurement (O, Figure 5). As the measurements continued anteriorly (Figure 5, O-R) the image on the film increased in size to become 3.17 per cent larger than the bony measurement from cuspal tip of the canine to the corresponding point on the maxillary base (R, Figure 5).

Horizontal Dimension: Horizontal measurements of the occlusal level of the teeth from tip of cusp to tip of cusp showed the image on the film to be 7.93 per cent smaller than the measurements on the skull from first permanent molar to second primary molar (S, Figure 5). This percentage decreased to almost half when comparing second primary molar to first primary molar (4.11 per cent, T, Figure 5). However, the latter measurements indicated that the image from the film was still smaller than the corresponding bony measurement. The measurement obtained from first primary molar to the canine was larger on the film (0.50 per cent) than the corresponding bony measurement (U, Figure 5), while the over-all measurement of the segment of the arch, first permanent molar to canine, showed the image on the film to be 3.06 per cent smaller than the measurement obtained from the skull (V, Figure 5).

Similar measurements obtained across the maxillary base showed a pattern comparable to those measurements obtained at the occlusal level, i.e., the image on the film was smaller than the bony measurement posteriorly (5.0 per cent, W, Figure 5) and became progressively larger than the bony measurements anteriorly (1.62 per cent, Y, Figure 5). The measurement over-all across the maxillary base from first permanent molar to canine was 0.55 per cent larger from the image on the film than the corresponding measurement obtained from the skull.

IV. DISCUSSION

Thurow[10] stated that "the two major factors, or problems in cephalometric work are (1) enlargement, and (2) distortion." In a strict sense, he is correct in separating the two phenomena. In actuality, they are seldom separable because enlargement can be regarded in isolation only if all the points are in a parallel plane in relation to the cassette. It is, therefore, a difficult task to determine how much of the difference is caused by enlargement and how much is caused by distortion. For example, the findings cited in this paper indicated that the measurement from the film was larger than the measurement of the object in most instances, and these findings generally would be accepted as a

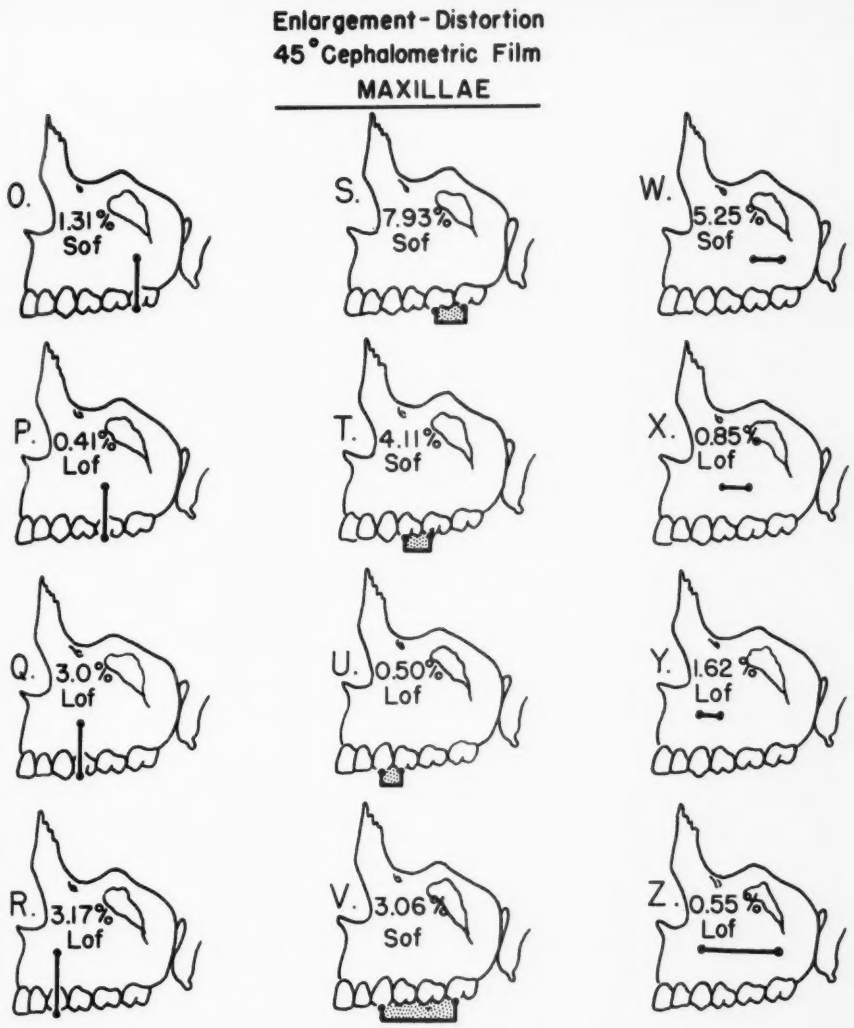

FIGURE 5. Maxillary schema illustrating 12 areas of measurement on oblique film and the corresponding percentage of distortion and enlargement relative to the same direct measurement on skulls. Lof = larger on film. Sof = smaller on film.

phenomenon of enlargement. On the other hand, some of the measurements indicated that the image on the film was smaller than the actual object. Recognizing that the object has been enlarged, this latter finding obviously would be produced by the variable contours of the skull and would result in a distorted view at the plane of the image.

Enlargement-Distortion: The upper illustration in Figure 6 graphically shows two objects (B and C) of the same

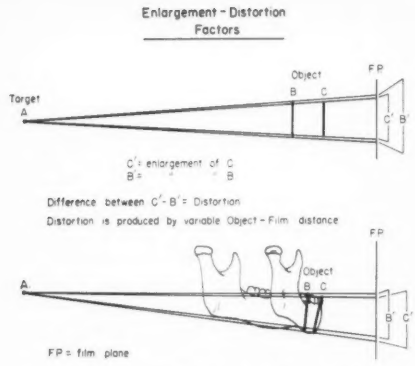

FIGURE 6. Illustration depicting the principles of distortion and enlargement of image on the film as a result of varying target-object and object-film plane distances.

size, but varying in their positions relative to the plane of the film. The amount of enlargement occurring at the plane of the film depends upon the distance that the object is from the target, or source of x-rays, and the distance from the subject to the plane of the film. In the example shown in Figure 6, each object is readily observed to produce a different size of image. Since standard cephalometric procedures have adopted five feet as the distance from the source of x-rays to the subject, this factor is constant and can be ignored. However, the distance of the subject is variable by adjusting the plane of the film and thereby produces variations in enlargement. Consequently, it is important that subject-film distance remain constant if the degree of enlargement is to be predicted by simple mathematical proportions.

According to Thurow "a constant enlargement can be ignored for angular measurements, superimposing serial tracings, and for ratios of linear measurements. Correction for enlargement becomes necessary when superimposing serial tracings, when linear distances are being compared, for linear ratios where the figures in the ratio are from different films, and for absolute linear measurements."

The lower illustration in Figure 6 shows a mandible at 45° of rotation relative to the central-axis ray. In this example objects B and C are the canine and first permanent molar. Lines drawn from the tips of the cusps to the base of the mandible would readily be visible as two separate and distinctly different degrees of enlargement since they are not in the same plane relative to the object-film distance. The difference between these two enlargements is the factor of distortion. An added contribution to the distortion comes from the lines drawn from B and C to the lower border of the mandible which are not in similar planes of space.

Object-Film Distance: In view of the variable size of the skulls, it was im-

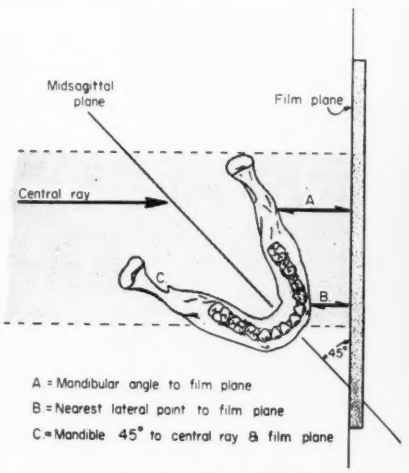

FIGURE 7. Mandible rotated to 45° of the central-axis ray and the plane of the film showing the difference in object-film distance occurring between the mandibular angle (A) and the buccal surface nearest to the plane of the film (B).

portant to measure the variation in point object to film distance even though the distance between the mid-sagittal point, at the transporionic axis, and the plane of the film remained constant (13.2 cm.). Figure 7 shows a mandible rotated to 45° of the plane of the film and central-axis ray. It follows that points A (mandibular angle) and points B (closest point to the plane of the film) would vary from a one-year-old skull to an adult and, thereby, the degrees of distortion and enlargement would vary considerably. By repositioning each skull of the study in the head-holder and measuring points A and B (Figure 8) the near point (B) varied between 7.0-8.5 cm. while the far point (A) ranged from 8.3 to 9.4 cm. These measurements indicated that the object-film distance of the 45° oblique film would be within a relative range of 1 cm. from one skull to another regardless of age.

It was interesting to note that Thurow[10] had shown that alteration of the object-film distance by 1 cm. changed the length of a 150 mm. object but 1 mm. Thurow stated further, "Since we are not likely to encounter a line longer than 15 cm. (150 mm.) in cephalometric work, this figure can be used as a safe guide."

Consequently, in the present paper the difference in size of skull was disregarded as an important influence in the technic of measurement and the results obtained.

Correctional Factors: Conventional cephalometric practice has adapted the technic of utilizing the mid-point of bilateral points and, thereby, of projecting all points to the mid-sagittal plane of the skull. In this fashion, all measurements are made from the mid-sagittal plane where the degree of enlargement is known.

The degree of enlargement generally encountered and accepted through routine radiographic cephalometry (frontal and lateral head-plates) varies between

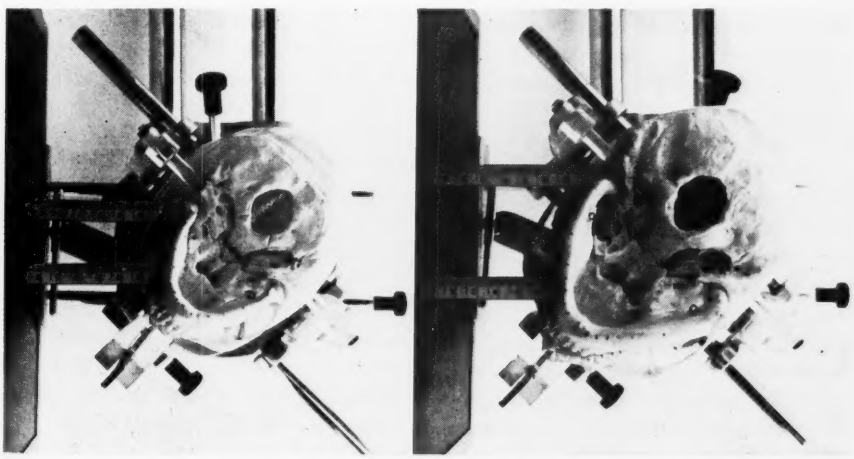

FIGURE 8. Illustrates a six-year-old skull (left) and an adult's skull (right) viewed from below with each skull properly oriented in the head-holder. Points B depict the total range seen in near-point distance (1.4 mm.) while points A depict the range in far-point distance (0.9 mm.) from object to plane of the film.

five and eight per cent depending upon the distance of the subject from the film (Adams[1]).

The present study has shown that correctional factors vary from site to site inasmuch as a common mid-sagittal plane is lacking. The factor of distortion and enlargement for the mandible ranged from 0.64 to 5.15 per cent depending upon the area measured (Figure 4). At the same time the maxillae showed a range from 0.5 to 7.93 per cent (Figure 5). The 7.93 per cent of variation in the maxillae occurred when measuring from the tip of the cusp of the first permanent molar to that of the second primary molar and represented the largest variation in the whole sample. In this particular area the measurement from the film was smaller than the skull measurement and indicated distortion.

In general, the percentage of variation in dimension between the object and its image on the oblique film was relatively small. If one considers that an error of three per cent in a 10 mm. measurement would equal 0.3 mm. then, obviously, measurements on the oblique film can be made with confidence in their accuracy.

Recently (1958) Hatton and Grainger[7] reported the reliability of measurements from cephalograms and showed that the technical process of cephalometry is highly refined and that no practical improvement was needed. They reported that the oblique rotation does not interfere with the target-subject distance nor with the central-axis ray to the film. Additionally, their findings showed *less* than a 10 per cent magnification by the oblique film. Hatton and Grainger[7] summarized their results by stating "measurements taken from different subjects can be used validly in making comparative studies and in constructing norms, if they have been obtained from the same type of head plate, and if the same, or duplicate equipment is used."

In demonstrating that the correctional factors imposed corrections of almost insignificant proportions, the point may be raised, why bother with correctional scales? This question is justified and the answer is that these correctional scales really are not essential for the greater number of investigations contemplated. In plotting increments of change or growth in an individual patient, investigators will be comparing films made from the same individual. In this fashion the variations in contour may be less than when comparing one individual with another. The employment of the correctional factors may be required only when absolute measurements are desired. At all other times it will probably suffice to measure changes of differences between films since the degree of distortion and enlargement is relatively small.

Yet all of these efforts have not been in vain for at least the validity of the method has been demonstrated and the need for elaborate corrections has been obviated. It also has served as a reminder that the flat image on the film is but a shadow of a three-dimensional object. As Thurow observed, in serial cephalometrics, the investigator is concerned with the small changes that occur within the individual patient. Thus the errors in measurement assume significance. If the investigator anticipates these errors, and corrects for them, he can be reasonably safe in his judgment.

Other Sources of Error: Based on the experience with the more conventional

projections, one may expect a greater source of error in the inconstancy of positioning the head within the head-holding device. This problem is now under separate investigation with living subjects.

Future studies are contemplated regarding methods of superimposing oblique films for the purpose of following serial developmental changes or changes occurring as the result of treatment.

V. SUMMARY

The purpose of this study was to measure the factor of distortion and enlargement of the oblique cephalometric film in view of its potential application to clinical and laboratory research. Ten skulls were used ranging in age from 1 year to the adult. Disks of silver solder, 0.030 inches in diameter, were cemented to 11 sites on each half of the mandible and to eight positions on each half of the maxilla. Each skull was oriented to Frankfort position in a cephalostat and rotated 45° to the plane of the film whereby exposures were made of each side. Measurements by calipers on skulls and film were made to within 0.1 mm. accuracy. Measurements were made of the mandibular and maxillary bases, tooth to tooth along the occlusal plane, and from the base to the occlusal height of both the maxilla and mandible.

The projection on the film was larger than the object in most instances. However, each area of measurement showed a per cent of variation that was typical for the area and relatively uniform from one skull to another regardless of age.

Distortion was present in the oblique film and was related to the variable contours of the maxillae and mandible. Because of such contours, certain measurements on the film were smaller than the direct measurements on the object. The distortion and enlargement encountered varied from bone to bone and from site to site within the bone.

The magnitude of distortion and enlargement on the oblique film was found to be no greater than that encountered in the more universally employed projections in radiographic cephalometry. In fact, the degree of distortion for the oblique film was less severe than that encountered with the standard lateral headplate.

This report permits one to conclude that the use of the oblique film provides a valid means for documentation and research.

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Chicago 12, Ill.

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The Child as a Patient

HUGO M. KULSTAD, D.D.S.

THE *normal* child's reaction to a visit to the dental office or to dental treatment is no different than that of a *normal* adult. Too much has already been written and said about the abnormal child, without identifying him as abnormal.

The bribing, towel methods, and even the entertainment procedures often used or talked about, are absolutely unnecessary in the treatment of normal children. The emphasizing of these technics in our periodicals and on our programs has had, however, an adverse effect on the general practitioner. A great many men regard such procedures as being routinely necessary on all children, and either legitimately or not, use the fact that they are not equipped for a small side show as good reason for not accepting young patients.

The very best pedodontists in this country do not complicate their practices by tricks, devices, prizes or fairyland atmospheres. The general practitioner should take children in his practice in the same proportion as they exist in the population. Outside of those few of us who are psychologically unable to adjust ourselves to the presence of young folks, and there are some adults so afflicted, there is no legitimate reason for the great majority of dentists to give any special thought to the treatment of children.

Normal children, which includes about ninety per cent of them, vary the same as normal adults in their ability to carry through an average day's activities. Those adults or youngsters who seem to be tired physically or mentally by the late afternoon should be given morning appointments, when they and the dentist are rested.

No patients should be kept waiting in the reception room for long periods, and even when short delays are necessary, each time anyone enters the waiting room they should be greeted promptly and assured of every consideration. Such attention will help keep tensions from developing in those few patients who are extremely nervous.

We must recognize that all patients have some apprehension about visiting the dental office. Several surveys have shown that the fear of pain is the major cause for people of all ages avoiding the dentist. Sedatives should be used for both adults and children who are unusually apprehensive of treatment, and most are. We routinely use a premedication on young children and all who show apprehension to first filling appointment. In some cases it is necessary even to do a prophylaxis. Those who need it get it for each appointment. Age does not govern our decision. We take a pretty complete medical history and try to be careful to avoid treating children with medical problems without consulting the child's physician on the telephone. Our assistant does this.

Seconal is the drug of choice in our office and is either prescribed or dispensed according to age and weight. Seconal capsules may be used rectally—increase dosage ¼ to ½ grains and allow ½ hour more time. Seconal does not take the place of anesthetics, however, it seems to enhance the anesthetic effect of locals.

Anesthetics must be used routinely to assist both the patient and the operator in cooperating to accomplish the best possible service with the least possible strain on each.

Examination

There are some differences of opinion as to what procedures should be included on the first appointed visit to the young patient. Some men believe that a prophylaxis should be done first and then the examination. In our office we do a thorough visual examination with mouth mirror and explorer and the x-ray examination is also done at this first appointment. Complete intra-oral x-rays, including bite-wings are routinely done. Always check every child's teeth in the closed position to ascertain degree of malocclusion, if any. This much should be considered minimum for the apparently normal child. Study casts and photographs may be necessary as well as Lactobacillus acidophilus counts to complete the examination. No disease or abnormality is *too small* to be treated.

In a summary of fourteen articles on comparative values of different procedures used in dental examinations, published in the Lederle Newsletter, it was conclusively proved that all three types, clinical mouth mirror and explorer, intra-oral, periapical and bite-wing x-rays were absolutely essential to find the majority of caries. It is also obvious that the soft tissues need careful examination.

At the time of the second appointment the treatment plan is routinely outlined to the parent. It must be realized that the average patient or parent has little concept of what we are talking about and it is well to demonstrate the procedures and services which we recommend. The amount of time necessary to prepare some demonstration models (visual aids they are called in education) will be saved many times over in the time required to convince the parent. The study cast of the patient's mouth is of course the best demonstration model.

We routinely talk of bite-wing x-rays, space maintainers, alloy or amalgam fillings and bridges. A few well chosen cases in your practice on which typical services are required can easily and with little cost or effort be duplicated and will serve you well and often.

One should be extremely careful in quoting fees to be sure you are completely understood. An approximate fee becomes a maximum fee to the patient no matter what you say about it at the time. You will never have any complaint about lowering the fee on the final statement because you have over-estimated, but it is best to absorb and not mention your errors in underestimating the problem. It is well to make it plain to parents that complete cooperation in keeping appointments, child behavior and account payment reduce our cost and such is reflected in our fees.

The size of the patient has no relationship to the size of fees and half-sized individuals do not ride for half fare in dental offices as they do on trains. If there should be any variation in fees for children over adults, having smaller mouths and requiring more difficult procedures because of large pulps and mixed dentitions, the fee for young patients would automatically be higher.

It is often advisable to demonstrate our explanation by using the child but at times it is best to talk to the parent alone. I believe fees are best discussed

with only the parent present and of course habit problems should never be discussed in the presence of the child, at least the first time.

We avoid discussing the manner in which fees are determined, whether on an hourly or item basis. We prefer to give a total fee where such is necessary and it in well many times to write up the treatment plan if it is complicated. We have found on large cases where only one parent accompanies the child, the written explanation helps at home (see below). Too often the most vivid memory is that the fee was a lot of dollars for "some fillings and things."

Summary of the Situation:

Johnny has had a high decay rate, having had several teeth filled and he has lost one primary molar. There is decay in most of his teeth now, even those which have been filled. The space where the tooth was lost has closed and the permanent tooth will not have room to come in.

There must be changes in Johnny's eating and his cleaning program as outlined to you.

Treatment Instructions:

All of the repairs must be done, even though some of the teeth may be lost in a year.

The space lost must be re-opened and a space maintainer placed, if the permanent tooth is not in by that time.

We will want to see Johnny every three months to check our work, his mouth development and care. The fee for this service, including examination, consultation, filling, space opening, fluoride treatment and cleaning will be $000.00.

Sometimes a parent will try to find out our charges per filling and it is well to try to explain that there is no fixed charge because of the obvious difference in complications. However, the size alone in most instances has little bearing on the cost.

A charge should always be included for the examination. All insurance companies, the Veterans Administration, and even Welfare programs pay for examinations and the dental profession must be consistent in charging a similar fee to all. Not many of our patients expect to get something for nothing and a moment spent in explaining the reasons for charging for the examination will convince those who question.

Prevention

We owe it to our patients to tell them all we know that will help them prevent dental disease. If done effectively such procedure will require time that must be compensated for. If dental service is to be regarded by the public as a health service we must place a value on consultation as well as mechanical services. Advice that will result in reducing the size of repair bills is a more valuable service than the repair could possibly be. Should any dentist fail to inform parents of the proved methods of reducing caries, he has not served fully and should not be compensated fully.

Each patient we serve must be given the benefit of complete repair, treatment of infection, prophylaxis, prevention procedures and follow-up through recall for maintenance. Such a program will reduce costs and result in better health.

Only by accepting our responsibility to serve fully in every way and insisting on each person assuming his responsibility for the aspects of his health that are within his control can we effectively combat the clamor for socialized health programs and New Zealand type dental nurses for children. Both Dr. Cyril Green of London, President of the American Dental Society of Europe and Official Representative of the British Dental Association to the American Dental Association Convention, and Dr.

Kenneth T. Adamson of Melbourne, Vice-President of the Australia Dental Association, stated at the 1951 American Dental Association meeting, that had the emphasis of practice in their respective countries been placed on *preventive* and *reparative services for children* they would not have been forced into socialized programs.

We must do everything within our power to extend our services to more people but let us at the same time serve those we now treat better.

Dentistry for children will be a gratifying experience and compensation will be not only the fee you received but also the real pleasure of accomplishment.

2030 Truxtun
Bakersfield, Calif.

PREPARATION OF MANUSCRIPTS FOR THE JOURNAL OF DENTISTRY FOR CHILDREN

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1. JONES, J. E.: Silicate Cements, J. Dent. Child., 21:79-93, 4th Q. 1954.

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Unit News

PHILADELPHIA—Annual Meeting
Pre-register before October 13, 14, 15, 1961. . . .
Membership increase in State Units. . . . Are you doing your part?
THIRD QUARTER deadline on July 25—Unit Reporters take note. . . .

TINY KONIKOW

Arizona

Garth Paxman of the Arizona Unit reports they completed a most successful workshop held one day prior to the official opening of the Arizona State Dental Association annual meeting in Phoenix on April 12. The attendance was 85. Clinician was Norman Olsen, of Northwestern University, who lectured on "Evaluation of Factors Contributing to Good Rapport in Your Office and Mine" and "The Challenge and Responsibility to the Injured Primary and Permanent Incisor."

At the business meeting luncheon, plans were made to have a Fall meeting in November. New officers elected for the coming year were as follows:

President	Richard LeSueur, Mesa
Vice-President	Ron Nielson, Tucson
Secretary-Treasurer	Garth Paxman

Northern California

Greetings from the Northern Cal Unit via reporter Jerome Leitner who reports that they met for breakfast at the Fairmont Hotel in San Francisco during the State Dental meeting. Approximately 100 men and women were in attendance and enjoyed a lecture by Roy Wolff of Missouri.

The Unit is making plans to hold the Sixth Annual Seminar in September at the Alisal Ranch in Solvang, a suburb of Santa Barbara. A two day series of talks is being arranged with Dr. Herbert K. Cooper of the Lancaster (Pennsylvania) Cleft Palate Clinic as the principal speaker. For information, write to: John Allan Bier, D.D.S., Chairman, 760 Market Street, San Francisco 2, California.

A resolution by the Unit was passed recently to create a perpetual fund to honor one of the pioneers in the field of Pedodontics for his contributions to dentistry and children. The fund will serve as a living memorial to Charles A. Sweet, Sr., and will be used for futhering the

education of students in the Department of Pedodontics. This fund became a reality on February 20, 1961.

The career-long dedication of Charles A. Sweet, Sr., Clinical Professor of Operative Dentistry, to Children's Dentistry is to be recognized by his colleagues with the creation of a continuing fund in his name to be used by P&S in the interest of education in the field of Pedodontics.

At a recent meeting of the Northern California Unit of the American Society of Dentistry for Children, the following resolution was passed:

"Whereas: Dr. Charles Sweet has been and is the leading inspiration behind Northern California's A.S.D.C. Unit since its very inception and

Whereas: He has been a teacher, instructor and friend of all men interested in Dentistry for Children, and

Whereas: He has graciously given of his time and efforts in support of our A.S.D.C. Unit, the National Association and the American Board of Pedontics.

Be it hereby resolved: that we of the Northern California Unit of the American Society of Dentistry for Children create and lead a fund to serve as a living memorial to Charles A. Sweet, Sr., D.D.S."

Willard Fleming, Dean of the University of California Dental School, and John Tocchini, Dean of the College of Physicians and Surgeons, were named co-chairmen of the Fund Committee. Members of the Committee are I. Irwin Beechen, Assistant Clinical Professor of Operative Dentistry; Francis L. Bushnell, '44B; Carl H. Ellertson, Jr., Donald G. Light, Edward S. Mack, Kenneth L. McKinnon, F. Haywood Norton, Lloyd F. Richards, John R. Sowden, Charles A. Sweet, Jr., '46; and Ralph Wagner.

Dr. Sweet graduated from the University of California School of Dentistry in 1919 and has been a dedicated member of the P&S faculty since 1941. He is also supervisor of Dental Health Education, Oakland School Department.

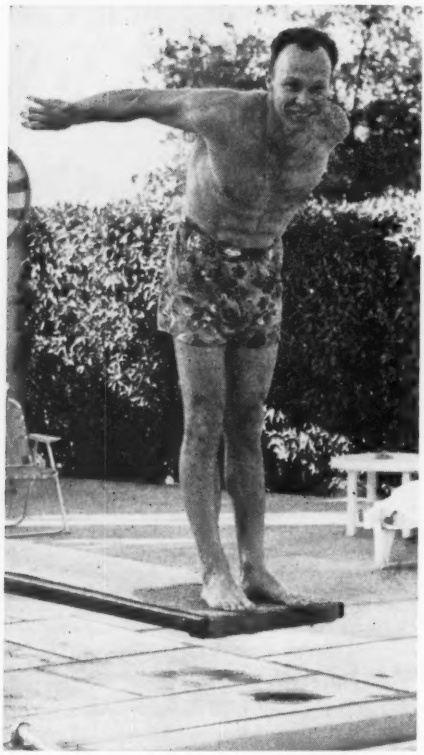
Southern California

Lorraine Duncan reports on an important activity held on April 24, 1961, at the Biltmore Hotel. John R. Abel addressed a co-sponsored meeting of the Southern Cal Unit and the Southern component of the Pacific Coast Society of Orthodontists. His topic was "Specialties in the American Dental Association," and was most informative.

Left to right: Emanuel Cheraskin, Jack Kennedy and Hugo Kulstad.

The following clinics were presented

Left to right: Dick Hallberg and essayist Ralph Ireland.



Dr. Harold Burg enjoys the pool.

at the Annual Clinic Day program on May 22, 1961:

One Hole Rubber Dam Technic . David Ashrow

Mouth Protectors for Athletics ..... Richard W. Hallberg

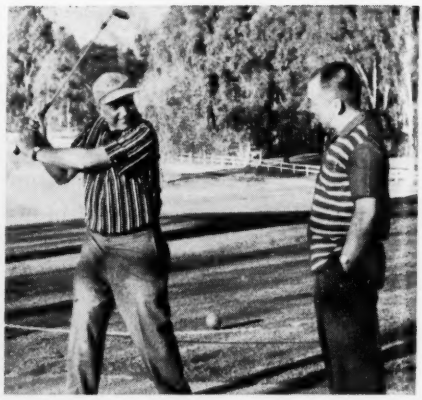
Amalgam Condensation .... Robert L. Heim

A Fixed Appliance for Control of Ectopically Erupting First Permanent Molars ..... Ronald V. Jones

X-Rays—Friend or Foe .... Harold E. Kratzer

Cavity Preparation in Primary Teeth ..... Bernard Z. Rabinowitch, assisted by Chas. Mindlin, Edith Straus, Samuel Borcarsky, John Whitaker, Daniel Brostoff and Paul Chan

Dental Health Puppet Show ..... Loretta Jung, D.H., Jane Winans, and Janet King



Golfers, left to right: Louis De Meo and Paul Chan.

Formocresol Pulpotomy for Primary Teeth ..... Philips Schlegel and Edw. Saito

Gold and Ceramic Restorations ..... Dean Bonlie and Ed Shryock (Student members)

It is interesting to note that Associate members (dental hygienists and student members) are able to participate in an important Southern Cal activity.

On March 23, 1961, Henry Nicklin was chairman for the Southern Cal Hypnodontic Society meeting held at the Gourmet Restaurant in Beverly Hills. Aldous Huxley of London, England lectured on "Hypnosis . . . Its History and Background." A Seminar on Hypnosis was held on April 8, 1961, with lecturer, Milton H. Erickson, M.D., covering the subject of "Psychodynamics and the Dentist."

Many of the Southern Cal Unit members are active in this organization. For further information, address inquiries to: Dr. Graham Zoff, Secretary, Box 1143, Santa Monica, California.

Colorado

Will Guard reports that the Colorado Unit held a two day Seminar on May 12,

13, 1961, at which time Dr. Wilmer Eames gave a very fine lecture on "Low Mercury-Amalgam Techniques for Pedodontics." Dr. John Revell from Shafter, California, also gave an interesting talk on "A Practical Office Approach to Surgery in Pedodontics."

Officers elected for the year are:

President ..... Vincent Kruzick, Littleton
Vice-President ..... A. J. Beaghler, Denver
Secretary-Treasurer ..... Willard F. Guard, Englewood

Connecticut

From past president Irv Eichenbaum, came this interesting report.

The Connecticut Unit held their Mid-Winter meeting on January 25, 1961, at the Statler-Hilton Hotel in Hartford. The Springfield Study Group of the Massachusetts Unit presented a very interesting program. Members of the Group included Alex Fox, Cleft Palate; Raymond Licht, Orthodontics; Irving Meyer, Oral Surgery; Leon Weiss, Periodontics; and David Webber, Pedodontics.

A most successful two day annual Spring meeting was held on April 19 and 20, 1961, at the Yale Motor Inn in Wallingford. William E. Brown of the A.S.D.C. Executive Council, presented a very fine summary on things that are new and could be anticipated in the realm of dental care for the young child and adult. Albert Richards, from the University of Michigan, spoke on "Radiography" and covered interpretation, technique and methods. His presentation was unique and outstanding.

In 1962, the Unit will observe the Tenth year of its organization. Plans are being made to make the anniversary a memorable one. The Unit now boasts a membership of 180 and still hopes to grow. The Connecticut Unit is also one of the few Units which have a newsletter or bulletin.

The following are the delegates who have been chosen to attend the National meeting in October: William Morrissey, William Buker, H. B. Knapp and E. E. Novey, Jr.

Hope to see all of you there, fellows.

Delaware

Roland V. Reed, Jr., reports on the new Delaware Unit activities. On May 1, 1961, at the Delaware Academy of Medicine, Joseph Brady and John Lavelle lectured on "Cavity Preparation in the Primary Teeth."

The Delaware Unit will sponsor an exhibit at the June meeting of the Delaware State Dental Association. Members are actively assisting the Pennsylvania Unit in their preparations for the National convention in Philadelphia.

Hawaii

Manuel Kau reports on some of the activities of Children's Dental Health week in Hawaii. Highlighting the observance was the presentation of two dental health nights by the presidents of the State Dental Association and the Honolulu County Dental Society.

Dr. Richard Dinham, president of the Honolulu County Dental Society gave an account of the numerous activities in which dentists in Hawaii have participated in an effort to bring the best of modern dentistry to the public.

Albert Lemes served as moderator on a panel of five members who presented material on the cause and control of tooth decay, periodontal diseases and malocclusion. Panel members were Marilyn Bradshaw, Donald Houvener, Samuel Glynn, George Uesato and Manuel Kau. It was requested that this panel

be ready to appear before other audiences.

Free x-rays were taken in conjunction with the dental health conference nights. Forty-seven persons received bite wing x-ray pictures without charge. The films were sent to the persons with instructions to take them to the family dentist.

Idaho

Wes Young reported that the Idaho and Montana Units are planning to hold a joint meeting at Jackson Hole, Wyoming, on July 21, 22, 23, 1961. Ralph MacDonald, president-elect of A.S.D.C., will be guest clinician. Dentists from Wyoming and Utah are being invited and urged to attend in hopes that enough interest can be "sparked" to bring about the formation of Units within the two states.

Illinois

Marvin Kozlov in his usual good form reports the news of his Unit. The Illinois Unit had a two day Spring Seminar meeting at the Wagon Wheel Lodge in Rockton, Illinois. The program was a most interesting one . . . one-third work, one-third business and one-third pleasure.

Sumter Arnim, professor of pathology at the University of Texas presented an all day discourse on many facets concerned with "Oral Disease." His talk stimulated much thought and discussion far beyond that one day.

The following morning, Sheldon Rosenstein, assistant professor of orthodontics at Northwestern University discussed "Interceptive Orthodontics." His presentation and discussion of some of the most important problems in orthodontics was very illuminating.

In the afternoon, the executive council and business meetings carried the

Unit well on its way toward plans for the future. Expansion of aims and ideas, and increase in membership will be promoted. Plans were made for the meeting in November, 1961, when Dr. Harry Sicher will discuss the always intriguing subject of "Theories of Eruption."

The following delegates and their alternates were appointed to attend the National meeting in October: Corvin Stein, Sr., Robert Way, Jane Selbe as delegates; and alternates, Norman Olsen, William Sowle, and Mark Mendelsohn.

Marv reported that the second issue of *Your Child Patient* is in press and will soon be distributed. This publication is the pride and joy of the Unit and will serve as a needed communicator.

More that 10,000 children entered Chicago's famous new lake front exposition hall, McCormick Place, before fire department officials closed the doors and turned away another 10,000 youngsters on the occasion of the Chicago Dental Society's first Children's Dental Health Day, February 5. Advance publicity on a program of free entertainment and free gifts brought the youngsters out and the *Chicago Tribune* news story the following day said "Ten thousand Chicago area youngsters got a lot of laughs yesterday, courtesy of their dentists." An editorial "Your Dentist Is Your Pal" was published in the *Tribune* a few days later as a salute to the success of the event which had dental health messages as a part of the programming. All other Chicago newspapers as well as radio and television stations gave outstanding coverage to the public service event. Dr. Norman Olsen, of Evanston, A.S.D.C. member, was chairman of the affair working with Dr. James N. Lynch of Glenview, president of the Chicago Dental Society and Dr. Edward J. Sullivan of Skokie. On page 114 is shown the exhibit of the American Society of Dentistry for Children set up in McCormick Place under the direction of Dr. Jane Selbe of Glenview, president of the Illinois A.S.D.C. Unit. A friendly "lion" participated to demonstrate proper brushing of the teeth.

Indiana

From Elizabeth Graves comes this news. The Indiana Unit held their annual meeting in conjunction with a Symposium on "Dentistry for the Adolescent" by the Indiana University School of Dentistry on April 19, 1961. The guest essayist was Dr. Cosmo Castaldi of the Faculty of Dentistry, University of Alberta, Edmonton, Canada. His subject included "Mental Growth and Development in the Ten to Sixteen Age Group" and "The Need for Fixed Bridge Prosthodontics in the Young Age Groups."

A business meeting followed a luncheon served in a private dining room at the University Student Union Bldg. The following officers were elected for 1961-62:

President ..... James R. Roche, Indianapolis
President-Elect . Richard Howard, Indianapolis
Secretary-Treasurer ..... Elizabeth Graves, Indianapolis

John Mink served as moderator at the morning session and in addition to the guest essayist introduced David F. Mitchell, Niles Hansen and Ralph McDonald who presented papers on "Oral Pathology and the Adolescent"; "Peridontal Diseases" and "Caries Control for the Teen-age Patient."

Drexell Boyd served as moderator for the afternoon session and presented Fredrick Hohlt and Paul Starkey who gave papers on "Protective Mouth Pieces for Contact Sports" and "Space Main-

tenance." John Mink also presented several cases.

From Donald Dicks came this added bit of news of the Indiana Unit.

The third Spring Seminar of the Unit was held at the Sheraton Hotel in French Lick on April 9, 10, 11, 1961, with 59 members attending. Guest essayist, Robert E. Moyers, University of Michigan, covered the following subjects:

1. Growth and Development of the Face and Dentition
2. The Etiology of Malocclusion
3. Diagnosis of Malocclusion in the Non-Orthodontist Office
4. Management of Space Problems
5. Treatment of Deleterious Habits
   a. Thumb and finger sucking
   b. Tongue problems
6. Treatment of Functional Malocclusions in the Primary and Mixed Dentition
7. Common Mistakes and their Sequelae

Six table clinics were given by members of the Ohio Unit under the direction of Paul Starkey of the Indiana University School of Dentistry.

Sunday night dinner followed an "ice breaker" in the Presidential Suite after which President Donald Dicks gave a paper on "The History of the Indiana Society." Twelve members of the Ohio Society helped to make this Seminar the most successful one that has been held.

Iowa

Good to hear from the Iowa Unit via Dale Redig. Here is what he has to report. The Iowa Unit held its meeting on April 10, 1961, at Hotel Savery in Des Moines. Dr. Sydney Finn of the University of Alabama presented a "well researched case" for Calcium Hydroxide as the morning portion of the program. In the afternoon, he covered the subjects of "Developmental Problems of Normal and Abnormal Dentitions" and "Treatment Indications for Traumatized Teeth." Attendance numbered over 75 and from all parts of the State.

Election of officers resulted in the following: (See picture below.)

President	Walter Yeager
President-Elect	Duane Schmidt
Vice-President	Ronald Hufford
Secretary-Treasurer	Dale Redig

Three cheers were given for pedodontists Schmidt, Lang and Bane who had articles published in the first Quarter issue of our JOURNAL.

Nice going, fellows!

Back row, left to right: Walt Yeager, president; Dale Redig, sec.-treas.; Duane Schmidt, president-elect; S.U.I. Pedo Dep't Head, Wm. Goodale. Front row: Miles Olson, past president; Exec. committee members Merle Bean and Sam Christensen; Ronald Hufford, vice-president.

Kansas

Joe Burket reports that the new Kansas Unit is now "off the runway" and had their first meeting and program in Kansas City on May 7, 1961, at Hotel Muehlebach. Guest clinician, and native born Kansan, Fran Summers, gave a most interesting presentation.

The Kansas Unit now has over one hundred members with more "Joining up" every week. For a new Unit, you are going great guns, Kansas. Keep up the good work!

Massachusetts

This bit of news from the Massachusetts Unit via Carl Cohen. The Unit held its annual meeting in conjunction with the State Dental Society on May 3, 1961. Guest speaker was Dr. Jack Wells, assistant dean and chairman of the Department of Pedodontics, University of Kansas School of Dentistry.

Officers elected for the ensuing year are:

President	Melvin H. Gulbrandsen
Vice-President	Carl G. Cohen
Secretary	Alvin A. Krakow
Treasurer	Leon Young

Michigan

Joe Engelman reports the news of the Michigan Unit. The Spring meeting was held on May 3, 1961, at the Michigan Union, Ann Arbor. Richard Christl gave a summary of the membership drive, reporting that the Unit now has a total membership of 332. President Konikow congratulated the membership committee for their efforts and untiring work in bringing about this increase in membership.

Bill Graetz presented the Constitution which had been revised by members of the Executive Council at an earlier meeting. It was decided to accept the Constitution as provisional until it can be presented to each member by mail.

A Mid-Central State Pedodontic Conference which would include Ohio, Michigan, Indiana and Wisconsin is being planned for the Spring of 1962. Michigan committee members, Robert Murray, Hugh Kopel, Wilbert Fletke and Tiny Konikow will work with committees from the State Units in setting up this conference.

James Simmons of Fort Worth, Texas, President of the American Society of Dentistry for Children was guest speak-

Panel members who discussed "Careers in Dentistry" are from left to right: Herschel Krebs, counselor at Milford High School; Tiny Konikow, pres. M.S.D.C.; Lewis Gach, Oakland Co. Dental Society; Dr. Clinton Emmerson, U. of Southern Cal School of Dentistry; Donald Bergeron, pres. Oakland Co. Dental Society; William Hunter, counselor of Birmingham Public schools.

er. Dr. Simmons had as his topic, "Practice Administration" and gave many interesting ideas for setting up a well organized and functional dental office. For his outstanding work in A.S.D.C. and in the field of dentistry for children, Dr. Simmons was given a plaque and made an honorary member of the Michigan Unit.

Editor Al Seyler presented a plaque to Marv Davis in acknowledgement of his contribution of the new design for the cover of the JOURNAL.

The Unit elected the following officers for the coming year:

President	Richard Christl
Vice-President	Robert Murray
Secretary-Treasurer	Walter Niemann

In line with the idea of co-sponsorship, the Unit will co-sponsor a meeting with the Jackson County Dental Society at Hotel Hayes, Jackson, Michigan, in the Fall.

Minnesota

Ned Brown in closing his report said "The gophers" are on the ball and climate for better children's dentistry is most favorable. Read this report and see if you agree.

The Annual meeting of the Minnesota "Twins" Unit was held at the Calhoun Beach Hotel in Minneapolis on May 16, 1961, and featured Daryl Feldmier, managing editor of the *Minneapolis Tribune.*

The election of officers concluded the business of the evening.

The Unit also did a fine job at the Minnesota State Dental Convention on March 17, 18, 19, 1961, by putting on an entire section of table clinics on various phases of children's dentistry. Several good-will measures are being attempted by the Gopher Unit in an effort to create interest in children's dentistry by both dentists and the general public. The Unit has purchased toothbrushes and tooth paste for distribution to needy children through the Hennepin County Welfare Department. Another outlet for the kits is a Home for Deserted Girls in Minneapolis.

The Unit is also making an annual cash gift to the outstanding senior pedodontic student together with a gift of $100 to the Department of Pedodontics of the Dental School of the University of Minnesota to be used for needed materials. The program of encouraging more student memberships in the Unit is being ably carried on by Bob Boller.

The Annual March all-day meeting was better than ever. The members had the privilege of hearing Dr. Merritt Pederson of Lincoln, Nebraska, lecture on "Your Future—Make It Pay."

I think we all agree the "gophers" are doing a terrific job!

Montana

Fred Schwin had this brief news to report on his Unit. The Montana and Idaho Units are planning a joint meeting to be held at Jackson, Wyoming, on July 22-23, 1961. A record turnout is expected to hear guest clinician, Ralph McDonald. All Utah and Wyoming dentists are cordially invited to attend.

New York

Edward Lusterman, general chairman of the 1961 Annual meeting of the New York Unit, reports on the successful three day meeting held on April 21, 22, 23, 1961, at the Island Inn, Westbury, Long Island. Over 200 members and guests attended. Following are some highlights of the program:

A Symposium on "Dental Health Education and Recruitment in the High School" was very favorably received.

Over 1,000 students at Baldwin High School attended, but many supervising dentists, dental hygiene teachers, vocational guidance personnel and health administrators from other areas either observed or participated, so that the session could serve as a prototype for similar programs to be conducted throughout the State and elsewhere. The session consisted of rotating clinics on six phases of dentistry with excellent visual aids furnished by the Oral Hygiene Committee of Greater New York. The essayists, Dr. Herbert Koepp-Baker of Carbondale, Illinois, and Dr. Norman Littleton of Washington, D. C., delivered some very outstanding lectures.

Mr. Alex Stefanik, methods engineer for the General Electric Co. and a panel consisting of Drs. Geo. Krikley, Edgar Miller and Walter Woods, gave an excellent presentation on "Time and Motion Aids to Make Dentistry More Efficient, Economical and Easier."

A registered Saturday luncheon was held with discussion leaders, and on Sunday registered clinics were presented. These innovations proved very popular and will probably be continued in the future.

Another outstanding event was the presentation of the First annual award of the New York Unit to Dr. Joseph H. Kauffmann, editor of the State bulletin, for services deemed outstanding in the field of child health. Dr. Kauffmann is well known and beloved by all for his zeal and ability in promoting the cause of dentistry for children. He truly merits the honor accorded him.

The following officers were elected to serve the Unit for 1961-1962:

President ..... Charles F. Beck, Tarrytown
President-Elect .... Walter R. Woods, Syracuse
Vice-President ..... Edward A. Lusterman, Rockville Centre
Secretary-Treasurer ..... Ovid Slavin, New Hyde Park

Twenty-five new members were enrolled in the Unit. The mid-year meet-

Audience at table clinic on treatment of simple crossbite. Clinicians (standing) Charles O. Pommier (left) and Arthur I. Thomas.

Edward Lusterman (left), general chairman and Sheldon Weiss, co-chairman public-professional relations.

Outgoing president Roland Hawes (left) turning over reins of office to newly elected president Charles Beck.

ing of the New York Unit will be held on September 15, 16, 17, 1961, at Saranac Inn, Saranac Lake, N. Y.

The New York Unit deserves a big hand for their outstanding activities and hearty congratulations to Ed Lusterman and his committee for a most interesting Annual meeting.

Abraham Kobren (left) presenting to Dr. Joseph H. Kauffmann the First Annual Award of the New York State Society of Dentistry for Children for services deemed outstanding in the field of child health.

Seated: Roland Hawes, retiring president; Charles Beck, president; Walter Woods, president-elect; Ovid Slavin, secretary-treasurer.

North Carolina

The North Carolina Unit held its annual Spring meeting in Chapel Hill on April 6. Featured speakers were, Herman Becks of the University of California and Sidney I. Kohn of Fairleigh-Dickinson University.

Plans have been formalized for a two day Seminar which will be held at Sedgefield Inn, Greensboro, N. C. Norman

Olsen, head of the Department of Pedodontics at Northwestern will be guest speaker. A cordial invitation is extended to members of other Units to attend. For further information, write to: Dr. Kermit Knudtzon, School of Dentistry, University of North Carolina, Chapel Hill, N. C. Meeting dates are November 3, 4, 1961.

Ohio

On January 18, 1961, a group of interested dentists met at Children's Hospital to discuss the feasibility of organizing a component section in the Toledo, Ohio, area. Plans were formulated and a meeting was held during Children's Dental Health week on Feb. 6, 1961, at the Toledo Academy of Medicine. It was attended by 62 dentists and assistants.

The following officers were elected:

President	Harvey G. Behner
Vice-President	Ralph E. Cole
Secretary	William J. Spath
Treasurer	Duane P. Johnson

The scientific program was presented by Wm. E. Brown, Jr., of Ann Arbor who spoke on "Treatment and Restoration of Fractured and Traumatized Young Anterior Teeth" at the morning session. Following lunch, Dr. N. H. Denner of Cleveland spoke on "Growth of Children's Dental Health Week Activities and Children's Dental Health Around the World." He also showed some very outstanding slides of his trip around the world. Dr. Brown continued his presentation in the afternoon speaking on "Interceptive Orthodontics in Dentistry for Children."

This first meeting was a great success and generated considerable enthusiasm for continuance of the group. Monday, May 22, 1961, was set for the next meeting.

An executive meeting of the Ohio Society of Dentistry for Children was held March 22, 1961, on the Ohio State University campus. Fourteen persons attended, including delegates for four of the five local components and guests, Dr. and Mrs. C. F. Tuma.

Joseph Costa and John Beal of Youngstown, and Del Halak, Cincinnati, represented their cities to announce interest in forming local sections in those areas. The purpose of this meeting was to consider plans to more closely integrate the local section on the state unit level and to stimulate student membership in the Society. Another meeting is planned for June.

The newly formed Toledo section took in twenty-nine new members at their first meeting in February. A nationally known pediatrician was scheduled for the meeting on May 22, 1961.

George Patrick has been keeping the Columbus members well informed in component activities with a local newsletter. General Neal Harper spoke on "Legal Aspects of Traumatically Injured Teeth" on May 3, 1961.

Fourteen Ohioans attended the Indiana Society's Seminar on April 9, 10, and 11, 1961. The Dayton section presented table clinics as part of the program. Among those who attended were: Dr. and Mrs. Ralph Cole of Toledo and Dr. and Mrs. Glenn Goodrich of Solon.

From Willian Davenport came this bit of news. The Stark County section held its quarterly meeting on March 7, 1961, at the Onesto Hotel, Canton, Ohio, with 14 members in attendance. Dr. James C. Tate showed a film on "Serial Extractions."

Oklahoma

T. J. Guthrie reports that the Oklahoma Unit met for an all-day program in Oklahoma City on February 14, 1961,

with Norman Olsen of Northwestern University as guest speaker. On April 23, the Unit held a meeting in conjunction with the Annual State Dental Association at Tulsa. Olaf Jacobson of Denver, Colorado, was the clinician and conducted a very successful all-day meeting.

The Unit is looking forward to a new year with greater enthusiasm than ever.

Oregon

D. R. Paulson reports that the new officers of the Oregon Unit are:

President ..... M. A. Matthews, Portland
President-Elect .... Richard W. Moore, Albany
Secretary ..... Donald G. Egerman, Albany
Treasurer ..... Marian deStoppelaar, Portland

Rhode Island

Stuart Manchester from the "little" State reports that their Unit held its March meeting at Johnson's Hummocks at which time Dr. Coenraad F. A. Moorrees gave a most interesting and informative talk on "Orthodontic Diagnosis for the Children's Dentist." Dr. Moorrees was born and educated in Holland and received his American dental degree in 1941 from the University of Pennsylvania.

On April 3, 1961, Daniel J. Holland, D.M.D., president of the American Board of Oral Surgery presented a program on "Oral Surgery for Children—Surgical Repositioning of Teeth for Orthodontics" which was very well received.

Past-president's Night was observed in conjunction with the May 1, 1961, meeting at Johnson's Hummocks. One of the highlights of the evening was the lecture by Dr. Harold Addelston on "Dental Practice Management."

Texas

Dick Jennings as chairman of the Publicity and Public Relations Committee of A.S.D.C. has available a promotional brochure which can be used in membership drive activities of the State Units. These brochures are great and more important, proved effective in Michigan, Florida, Texas and Minnesota. If you desire copies, please write to: Richard Jennings, D.D.S., University of Texas Dental Branch, Box 20068, Houston 25, Texas.

Virginia

Charlie Vincent is still doing his fine bit of reporting. Here it is. The Annual meeting of the Virginia Unit was held in Roanoke on April 30, 1961, at the Hotel Roanoke. A social hour and banquet preceded the scientific presentation.

Doctors Stephen Hopkins, Sr., and Stephen Hopkins, Jr., presented a program entitled "The Orthodontist Talks to the Pedodontists" which proved to be most informative and enlightening. A great team, these Hopkins!

With summer approaching, the Unit's activities were concluded at this meeting until next fall.

Announcements

The Association of American Women Dentists will meet in Philadelphia on October 15-16, 1961, at the Warwick Hotel. Guests are cordially invited to attend the banquet on the evening of October 16. For further particulars, write to: Mary DeRisi, Chairman, 2849 29th Pl. N. W. Washington, D. C.

* * *

Indiana Society of Pedodontics

Eighteen practicing pedodontists in the State of Indiana met and after much consideration, they organized the Indiana State Society of Pedodontics. The objects of this organization are:

1. To promote study, research,

fellowship, cooperation and understanding among the Pedodontists in the State.

2. Act in an advisory capacity to State and local Dental Societies in matters pertaining to Pedodontics.

3. Act as spokesman for Indiana Practicing Pedodontists in legislative matters publicly, and public relations in oral rehabilitation of handicapped children.

4. Support the American Society of Dentistry for Children.

5. Strive to maintain the highest standard of ethics and practice in Pedodontics.

6. It shall be a non-profit organization.

The officers are:

President ..... Betty J. Koss, Indianapolis
President-Elect .... Theodore Bean, Valparaiso
Vice-President ..... John Werner, Elkhart
Secretary ..... Robert Buckley, Indianapolis
Treasurer ..... Al Fromm, South Bend

Sounds like a very worthwhile study group. Thanks, Betty Koss, for telling us about your group.

* * *

The Children's Hospital of Baltimore has received a grant from the Children's Bureau; the Department of Health, Education and Welfare; and the Maryland State Department of Health for $70,000 per year.

The money will be used to establish a demonstration project designed to meet the dental needs of handicapped patients within the State of Maryland. It is hoped that this program will serve as a model for similar projects in other States throughout the country.

The program at Children's Hospital is under the direction of Dr. Burton R. Pollack and is being conducted in cooperation with the Department of Pediatrics at the Johns Hopkins Hospital.

* * *

The American Board of Hypnosis in Dentistry will meet on October 5, 1961, at the Sheraton-Cleveland Hotel, Cleveland, Ohio. Applicants for certification who wish to appear for examination at this time should communicate with the Secretary, Dr. S. Irwin Shaw, 18201 Cherrylawn Ave., Detroit 21, Michigan, prior to September 1, 1961.

* * *

For the benefit of Children's Hospital, Philadelphia, Pennsylvania, Van Cliburn and the Philadelphia Orchestra, Eugene Ormandy conducting, will present an outstanding program at the Academy of Music, Philadelphia, Monday evening, October 6, 1961. Mrs. E. J. MacMullen, Rittenhouse Plaza, Philadelphia 3, Pa., will be pleased to have your reservation.

* * *

Graduate Training

For information regarding the Graduate Program in Pedodontics, please contact Dr. McCarthy, Dean of Baylor University College of Dentistry, Dallas 10, Texas. Two or more graduate students will be accepted for study toward a Master's Degree in Dentistry for Children. Applications should be received before February 1962.

* * *

Course Announcements

Address all inquiries concerning the following Postgraduate courses to: Dr. Jos. A. Cuttita, chairman, Postgraduate Admissions, Columbia University, School

of Dental & Oral Surgery, 630 W. 168th St., New York 32, N. Y.

PD 402 Preventive Orthodontics—July 10-14, 1961

PD 403 Diagnosis—September 15, 1961

PD 432 Temporomandibular Joint Disorders—October 9-11, 1961

PD 353 Theory and Practice of Pedodontics—September 15, 1961

* * *

Address inquiries concerning the following courses to: Office of Postgraduate Dental Instruction, School of Dentistry, Box 750, Chapel Hill, North Carolina.

Dentistry for Children I.—July 10-14, 1961 (Child Management and Economics, Diagnosis, Cavity Preparation, Pulp Therapy)

Dentistry for Children II.—July 17-21, 1961 (Fixed and Removable Prostheses, Fractured Incisors, Visual Aids)

Dentistry for Children III.—July 24-28, 1961 (Preventive Orthodontics)

* * *

Address all inquiries concerning the following postgraduate course to: Dr. J. W. Neilson, dean of Dentistry, University of Manitoba, Winnipeg 3, Canada.

Restorative Dentistry—Dr. Miles Markley, Denver, Colorado, October 3-6, 1961

* * *

The New York University, College of Dentistry, announces a Postgraduate course as follows:

104 Pedodontics—September 14, May 17, 1961, Dr. Harold K. Addelston and Dr. Sidney M. Kronfeld

For information contact: Director, Postgraduate Division, College of Dentistry, New York University, 421 First Ave., New York 10, N. Y.

* * *

Address inquiries on the following courses to: Director, Postgraduate Division, Loyola University, School of Dentistry, 1757 W. Harrison St., Chicago 12, Illinois.

General Analgesia and Anesthesia—Beginning Wednesday, September 28, 1961

Construction of Porcelain Jacket Crown—Beginning on Saturday, October 1, 1961

* * *

For information regarding the following course, please write to: Dr. W. J. Simon, Dean of College of Dentistry, State University of Iowa, Iowa City, Iowa.

Postgraduate Course in Pedodontics—October 23, 24, 25, 26, 1961, Dr. W. G. Goodale and Associates

* * *

Address inquiries on the following courses to: Course Director, c/o Faculty of Dentistry, University of Alberta, Edmonton, Alberta.

Oral Diagnosis—September 11-14, 1961, Dr. K. M. McMurdy

Oral Roentgenology—October 4-6, 1961, Dr. H. R. MacLean

Finer Amalgam Restorations—October 9-11, 1961, Dr. G. H. Gibbs

Material intended for the Unit News should be sent to Tiny Konikow, 500 S. Washington Ave., Royal Oak, Michigan. Deadline dates: First Quarter, January 25; Second Quarter, April 25; Third Quarter, July 25; Fourth Quarter, October 25.

What Drugs to Prescribe and When*

MARVIN SNIDERMAN, D.D.S.

The extremely fertile mating of the pharmaceutical chemist in the laboratory with the pharmaceutical manufacturer has produced a steady parade of new drugs that makes learning enough about them to attempt to evaluate their relative therapeutic merits an almost Herculean task. Yet the choice of a drug determines whether the patient will receive the most judicious therapy. Drugs often appear and disappear from the market almost too quickly to permit learning their names, to say nothing of distinguishing which are the same drugs with different trade names.

EVERY day, the practitioners, medical of course more than dental, are bombarded with a barrage of attractive, readable, and far from uninteresting literature in the mails. The practitioners who read the literature will find that early reports on new drugs tend to be positive, the possible uses emphasized, and the limitations minimized. Quite often, the first hopes are not borne out by later experience.

Most therapeutic agents need time and experience for final evaluation; it is a very rare exception when a compound, like penicillin, is established as both eminently useful and relatively safe from the very beginning.

The problem of the choice of "which drug" can be exemplified by a comparison of trade name prescription drugs available today, in 1960, with those available in 1949. The author has surveyed these drugs using the *Physicians' Desk Reference* and the following are some of the comparisons:

	1949	*1960*
Adrenocorticals	3	173
Systemic analgesics	28	352
Anti-anxiety	—	70
Anti-bacterials	112	266
Anti-depressants	4	108
Antihistamines	11	260
Anti-obesity	1	127
Antipruritics	28	113
Antispasmodics	69	230
Ataraxics	—	88
Barbiturate preparations	93	240
Belladonna preparations	13	60
Hypnotics	22	137
Penicillin preparations	90	320
Phenobarbital preparations	12	175
Sedatives	200	370
Multiple vitamins	90	210

Potency, curve of action, characteristics of absorption, and elimination, all play a decisive role in determining where a drug may be used and, in the end, whether, despite desirable pharmacologic actions, it can be used well, or at all.

Potency

The potency of a drug, namely the amount by weight necessary to produce an effect, is of obvious practical importance, since it determines the amount which will be necessary to produce a therapeutic response. However, in some instances, the potency of drugs is expressed in the literature, as to be truly misleading. For example, there are barbiturates for which the average hypnotic dose for man is appreciably smaller than the usual barbiturate (less than the common capsule containing 100 mg.). Such a barbiturate has been advertised as be-

* Reprinted from *Pennsylvania Dental Journal*, March, 1961.

ing safer than others of which more has to be used for similar effect. The implication here is that the smaller dose is less likely to cause difficulties. On the other hand, less potent barbiturates which require more drug per hypnotic dose than the usual have been advertised as being preferable because a larger than usual amount is required for toxic effects. The implication here is that difficulties are not so likely to be encountered because a larger amount is necessary to cause toxicity. Obviously both arguments cannot be correct, but what is more important, both are wrong. The relative difference in therapeutic ratio is more important than relative potency. The therapeutic ratio is the physical amount of a drug which will produce a pharmacodynamic effect in relation to the amount of the same drug which will produce untoward effects under the same circumstances. The therapeutic ratio is the relationship between therapeutic and toxic potency.

Improper dosage with the proper drug is a common reason for therapeutic failure. Token effects of drugs are useless. Dosage may be insufficient due to the practitioner's timidity or the patient's tolerance, excessive through the practitioner's exuberance or the patient's sensitivity. Dosage depends upon potency, toxicity, urgency of the condition, and the influence of the patient's disease in reactivity or elimination of the drug. The dose which may be used implies a consideration of the amount necessary to induce a useful therapeutic effect in the face of the danger of producing untoward effects.

The average dose is a term which would ordinarily mean an arithmetic average of all doses given; rather, it is the dose given the average patient. It usually signifies the safe dose to start the medication and it is calculated to induce a relatively low incidence of untoward effects.

The attitude of the practitioner as well as of the patient is important in shaping responses to treatment. Both are usually hopeful; they desire that the medication do the job. The use of positive suggestion when presenting the prescription to the patient will often do much more good than just handing the prescription to the patient with a shrug or no indication of mood.

Selection of Drug

By some means or other, the practitioner must decide which of the drugs available or suggested for a particular purpose is the best. It is his obligation to make this decision, but in doing so he must be wary of the prejudiced advice served to him by the drug manufacturer. The manufacturer will usually tell him little but the superiority of his products.

One other important phase of medication must be discussed—that of the placebo—this has a definite place in the practice of the healing arts, and should not be too quickly discounted as a means of helping many patients.

The Prescription

A prescription is a written order by a physician, dentist, or veterinarian directing a pharmacist to supply one or more drugs, directions for dispensing and/or compounding to the pharmacist and directions for use by the patient. The prescription may be written in English or Latin, or a combination of both. Every prescription should be typewritten or written in ink on a prescription blank form. The name and address of the pa-

tient should be clearly written. The name or names of drugs follow with directions to the pharmacist as to quantity and compounding of them. The directions for taking the medication are next; it is not good practice to write: "use as directed," unless the directions are demonstrated such as with a mouthwash. The prescription must be signed by the practitioner, and his name, address, and Federal Narcotic Registry Number should appear along with the date.

The Federal Narcotic Registry Number is issued by the nearest office of the Director of Internal Revenue, and is obtained upon application for the number and payment of a fee of one dollar per year. With this number assigned, the dentist is able to write prescriptions for those drugs that are governed by the narcotic laws under the Harrison Narcotic Act.

Control of Pain—Fear

The interest of the dentist in pain prevention dates back to the time when Horace Wells, in 1844, discovered the use of general anesthesia. Current pain control methods include the use of local anesthetic agents, topical anesthetics, newer operative procedures including the use of tungsten carbide burs and diamond instruments, water spray, high speed rotational instruments, chemotherapeutic sedatives, hypnotics and tranquilizers, a psychological approach, hypnosis, and the use of general anesthetics.

We must lessen apprehension, tension, fear. We must no longer be content with eliminating pain in the area of the operative field. The dentist who does not take into consideration the emotional attitude of the patient before, during, and following treatment, and does not attempt to intelligently use all the tools and aids available to him to make the dental experience as pleasant as possible, is not providing total or adequate dental care for his patients.

People who are stable individuals and who have a history of well-tolerated medical or dental experience make wonderful patients, but those who are maladjusted, apprehensive, physically or mentally unable to cope with situations that arise, are the greatest problems to us. Ideally we are searching for and desirous of achieving calmness with no anxiety coupled with the ability to tolerate some pain without a violent reaction.

Ideal sedatives should adequately reduce preoperative psychic tension without concomitant depression of respiration and circulation. We should aim for a true sedative, a muscle relaxant, and an anticonvulsant all together.

The management of pain remains a difficult clinical problem which confronts every practitioner of the healing arts. The existence of pain and the possibilities for its management probably constitute the most ancient reasons for the existence of the physician, for pain is as old as mankind. The monumental achievements of medicine and dentistry during the last quarter-century have made possible prevention or elimination of a great deal of suffering. The great strides taken by all branches of surgery and anesthesia have made it possible to remove the cause of the pain or to interrupt its pathways in circumstances which previously precluded surgical intervention. Moreover, the development of many systemic analgesics, local and general anesthetics, and other agents have provided practitioners with a huge

arsenal filled with pain-relieving remedies.

Of all the indications for a dentist to write prescriptions, those for postoperative pain would be the most frequent. The most common method employed is that of the systemic administration of analgesics. Analgesics, by definition, include the drugs which, through their action on the nervous system, reduce or abolish suffering from pain without producing unconsciousness.

Obviously each practitioner has certain "favorites" in the drugs that he uses. The more times that he uses these drugs, the better he is able to evaluate their effectiveness.

In selecting the type of analgesic to be used, the quality and intensity of pain are the most important considerations. Mild pain can be adequately controlled with non-addictive analgesics. Opiates and "opioids" are to be used when the anticipated pain will be more severe.

Clinically the value of combinations of drugs to provide a potentiated therapeutic effect has been appreciated for many years. The exact mechanisms for potentiation are not clear, however pain itself is a complex response to a number of physiologic and psychologic derangements.

Non-addictive analgesics include salicylates, para-aminophenols, and pyrazolons. The salicylates include: sodium salicylate, potassium salicylate, and acetylsalicylic acid—commonly known as aspirin. The para-aminophenols include acetanilid and acetophenetidin, commonly known as phenacitin. The pyrazolons include antipyrine, and aminopyrine. The widespread use of these agents during the past century attests to their effectiveness in relieving mild pain. Acetylsalicylic acid is used more frequently for the relief of mild pain than all other drugs combined. Although this group of drugs is much less potent than the opiates and opioids, they possess significant advantages in that they do not produce tolerance or addiction.

There are two new non-addictive analgesic drugs to which we must give some consideration—dextro-propoxyphene (Darvon) and ethoheptazine (Zactane). These drugs are supposed to have an action similar to codeine yet they are not narcotics, and occur on the market as such, or in combination with other drugs. Dextro-propoxyphene in combination with aspirin compound comes as "Darvon Compound," and ethoheptizine in combination with aspirin occurs as "Zactirin."

For severe pain, one of the synthetic opiates such as Demerol or Percodan may be used.

At the end of this monograph, you will see in prescription A, we have the formula for what is commonly known as APC, PAC, or aspirin compound, which can be found as such or in various trade products under different names. The psychological effect of saying to the patient "Here is a prescription that will relieve any pain or discomfort you may have," is very important and will do the patient infinitely much more good than saying to him, "Get a bottle of aspirin compound tablets and take one every three hours or so if you have any pain." In prescription B we have combined the ingredients of prescription A with codeine sulfate and this now becomes a narcotic prescription and is to be used when more than moderate pain is expected. The amount of codeine in the regularly prepared tablets usually found is 1/8, 1/4, 1/2, and 1 grain respectively. This can be varied depending on

the severity of pain that is anticipated. In prescription C, we have a proprietary formula of a synthetic narcotic for very severe pain.

Prescription A could be used, for example, when a patient presents with Vincent's infection, or the extraction of one or two teeth, in which little difficulty has been experienced, or perhaps mild discomfort accompanying a pericoronitis. Prescription B can be used, when several teeth have been extracted, or when more severe pain is to be expected—such as the insertion of an immediate denture, etc. For the most severe type of pain Prescription C is indicated.

Next in frequency of use are the prescriptions that are written for preoperative sedation. The literature is replete with many monographs that tell of the benefits of sedation before dental procedures. In every surgical procedure, and in most operative procedures that will last one hour or more, you will have a more cooperative, relaxed and comfortable patient if you will prescribe a preoperative sedative. In all four of the prescriptions for preoperative sedation, the patient will be able to come to the office alone, and will be able to leave without being accompanied by another person. In the examples, prescription A is a combination of drugs that will give analgesic action, and also because of the methantheline (Banthine) it will decrease salivary secretions.

In prescription B, we have a tranquilizing drug. Before prolonged use of these drugs, it is wise to consult with the patient's physician. The concept of bringing about a calm or more tranquil mental state without any considerable degree of sedation is of recent origin. The antihistamine promethazine was early noticed to possess the ability to calm excited emotional states. Analogues of promethazine were prepared and the phenothiazine series soon supplied most of the more effective tranquilizing drugs. The search for more active antihistamines led to the discovery of the diphenylmethanes, a less potent class of agents than the phenothiazines. The barbiturates, and other sedatives, especially those exhibiting weak depressant properties, as well as the more potent sedatives can be used to relax the patient. Several chemically unrelated agents exhibiting tranquilizing action have been added to the list. As a result of all this activity, there are now more than three dozen drugs recommended and being used as tranquilizers.

These agents are second only to the antibiotics as the most commonly prescribed drugs—one out of three prescriptions written is for tranquilizers and they continue to increase in popularity. These drugs are also called ataractic drugs and phrenotropic depressants.

Of the tranquilizing drugs available, by far the safest ones for dental use would appear to be the propanediols and butanediaols. These drugs include phenaglycodol and meprobamate. They are useful agents in the treatment of the anxious, tense, neurotic patient who has no psychosis. Some relief of muscle spasm and its attendant pain syndrome is afforded by these agents.

Combining these drugs with an analgesic such as aspirin or aspirin compound can be considered when the barbiturate-aspirin compound combinations are not effective. Note prescription C.

The use of these prescriptions will generally result in a much more cooperative patient if one dose is taken at bedtime "to assure a good night's sleep"

and one dose one hour before the dental appointment.

In prescription D we have a combination of phenobarbital, 1/4 grain, along with aspirin, phenacetin, and hyoscyamine sulfate. It is a well-known fact that by adding a barbiturate to aspirin, we get a narcotic-like effect. This is a particularly good combination of drugs used as a premedication.

In the majority of cases, no prescription need be written. A dose of the drug can be given in the office just before the injection of the local anesthetic drug, usually producing a relaxed patient.

Prescriptions to control salivation are often indicated. In the patient who exhibits excessive salivation and for whom restorations in the lower jaw are to be done, the use of this type of medication may produce a more successful end result. In order to achieve the best results, it is best to prescribe the tablets to be taken four hours and one hour before the anticipated time of appointment. Administering it immediately before operative procedures generally will not produce a sufficiently good result. Methantheline (Banthine) seems to give moderate to full effects lasting as long as 3 to 6 hours after administration, and seems to work better than atropine and other synthetic anticholinergic drugs. (Prescription 3.)

Antibiotics

In the general practice of dentistry, the oral antibiotic has, at this writing, become a boon to the treatment of infections of the oral cavity. In the end of 1957, the "V" antibiotic drugs were introduced with many of the antibiotics used orally. The "V" means that it is buffered to create a better solubility factor.

In the truly dental need for the antibiotics, we can use good professional judgment and prescribe the drugs as indicated, of course, questioning the patient as to previous reaction or sensitivity to the drugs. However, where a cardiac lesion exists, or a history of rheumatic fever is elicited from the patient and the need for the antibiotic is determined, a good professional liaison is established by consulting with the physician, and a request for his preference in drug for the patient should be made.

Penicillin remains the most effective drug for the treatment of infections of the oral cavity. However, erythromycin closely resembles penicillin in its antibacterial action. You could use, if you wish, a prescription like number 5 in case the patient is penicillin-sensitive. Or, the broad-spectrum antibiotic can be used such as in prescription number 6.

It is not good practice to use antibiotic troches, unless they contain the type of antibiotics that would never be used systemically such as bacitracin, neomycin, and polymytin B. If antibiotics are indicated, they should be used systemically and used for a sufficient period of time to exert the desired action without risk of sensitizing the patient.

Deeply seated organisms are best approached systemically. It is dangerous to rely on local medication alone in the treatment of severe infections. Inadequate dosage and indiscriminate use of topical antibiotic compounds in the treatment of infectious diseases can breed resistant bacterial strains.

As dentists, we are not called upon to treat allergies as such. In many cases,

however, the use of the antihistamine drugs are indicated from time to time. The acutely sore mouth as a result of allergy to a dentifrice is seen occasionally. Number 7 is the type of prescription that could be used.

As to vitamin therapy, it is a rare instance where a true vitamin deficiency is able to be diagnosed by visual inspection. However, there are cases where we may feel that the patient would be helped by doses of vitamins that will supplement an otherwise "poor" diet. The college student away from home, or the young working man or woman who does not live at home, is probably most in need of this type of supplemental therapy. (Prescription numbers 8 and 9.)

Dosage

When figuring the dosage of drugs it will vary with each individual. It is rather obvious that the 110 pound housewife should receive less of a drug than the 225 pound millworker. With the child, Young's Rule can apply. *Young's Rule for Children's Dosage:*

$$\frac{\text{Age}}{\text{Age plus 12}} \times \text{Average Dose}$$

In many states, the prescriber has a special protection in that it is the legal responsibility of the pharmacist to refuse to compound and fill the prescription before contacting the man who wrote it, in a case where a mistake has been made in writing for an overdose of a drug or whenever there is any question in the pharmacist's mind concerning dosage, etc. I can only suggest that your best friend when it comes to writing prescriptions is your pharmacist, he will discuss with you dosage forms of drugs, uses, and in addition, keep you informed of new drugs as they might be used in your practice. If there is an occasion where you know that a drug or a combination of drugs is necessary, and you are not sure of dosage, etc., elicit the name of the patient's pharmacist and tell the patient that you wish to discuss with him a new drug and that the pharmacist will have the prescription ready for him. After the patient leaves the office, phone the pharmacist, and tell him of your desires and he will gladly offer one or several suggestions to you. He will not think ill of you; on the contrary, he will respect you all the more.

It is suggested that you familiarize yourself with these or a number of basic prescriptions, their indications, and contraindications, and then broaden your base of use from there. Your patients will greatly appreciate this service to them.

Prescriptions for the Dentist

1. For Postoperative Pain

A—

℞

Acid Acetylsal. ..... gr. iiiss
Acetophenetidin ..... gr. iiss
Caffeine Cit. ..... gr. ss
Mitte tales caps. 15
Sig. Cap. one (1) q. 4 hrs. p.r.n. pain

B—*

℞

A.S.A. Comp. $\bar{c}$ Cod. gr. ½
Tabs. No. Xii
S. Tab. one (1) q. 4 hrs. for pain as necessary

C—*

℞

Percodan Tabs. No. Xii
S. Tab. one (1) q. 4 hrs. p.r.n. pain

* Requires Federal Narcotic Registry Number.

2. For Preoperative Sedation

A—

℞

Banthine ..... 25 mg.
Sod. Pentobarbital ..... 65 mg.
Acid Acetylsalicylic ..... 300 mg.
M. et. Ft. Tales Caps. No. XV
S. Cap. i one hr. before dental appointment

B—

℞

Tab. Meprobamate ..... 400 mg.
Mitte tales No. X
S. Tab. i one hr. before dental appointment

C—

℞

Darvo-Tran
Caps. No. XV
Sig. Caps. i at bedtime and caps. i one hr. before dental appointment

D—

℞

Caps. Phenaphen
M. T. D. No. XV
S. Tab. i at bedtime and tab. i one hr. before dental appointment

3. To Control Salivation

℞

Banthine Tabs. ..... 50 mg.
M. T. D. No. X
S. Tab. i 4 hrs. and i hr. before dental appointment

4. Vincent's Infection, cellulitis, abscesses, history of cardiac lesion

℞

Penicillin—V Tabs. ..... 300 mg.
Tabs. No. Xii
S. Tab. i t.i.d.

5. Oral Infections

℞

Ilosone Pulv. ..... 250 mg.
M. T. D. No. Xii
S. One capsule four times each day

6. Broad spectrum antibiotic

℞

Mysteclin-V ..... 250 mg.
Caps. No. Xii
S. Two caps. at once, then one caps. q.i.d.

7. Allergic Reaction

℞

Chlor-Trimeton ..... 4 mg.
Tabs. No. X
S. Tab. i q. 6 hrs.

8. Gingivitis, Periodontitis

℞

Acid Ascorbic ..... 250 mg.
M. T. D. Tabs. No. C
S. Tab. one (1) t.i.d.a.c.

9. Multivitamin

℞

Vi-Magna Capsules
Caps. No. C
S. Cap. i daily

624 Jenkins Arcade Bldg.
Pittsburgh 22, Pa.

1961 ANNUAL MEETING

SATURDAY—

October 14, 1961—8:45 to 10:15 A.M.

CLOSED CIRCUIT TELEVISION PROGRAM ON CLEFT PALATE

10:30 to 12:00 Noon

REGISTERED CLINICS

SUNDAY—

October 15, 1961—9:00 to 10:30 A.M.

REPEAT REGISTERED CLINICS

11:00 A.M. to 1:00 P.M.

DEMONSTRATION AND/OR TABLE CLINICS

By dental schools, state unit personnel and other organizations.

2:00 to 4:00 P.M.

SYMPOSIUM ON GROWTH PROBLEMS

REGISTERED CLINICS

1. AN UNDERSTANDING OF GROWTH AND DEVELOPMENT IN THE PRACTICE OF PEDODONTICS
   DR. SAMUEL PRUZANSKY AND ASSOCIATES
   Associate Director—Cleft Palate Clinic and Training Program, Center for Handicapped Children, Chicago

2. THE USE OF REMOVABLE APPLIANCES IN PREVENTIVE OR INTERCEPTIVE ORTHODONTICS
   DR. SIDNEY B. FINN
   Professor of Pedodontics
   University of Alabama, School of Dentistry

3. GENERAL ANESTHESIA FOR CHILDREN
   DR. LEONARD BACHMAN
   Director, Department of Anesthesiology
   The Children's Hospital of Philadelphia

4. PROSTHETIC APPLIANCES FOR CHILDREN
   DR. ALBERT L. ANDERSON
   Past President
   American Society of Dentistry for Children

5. LOCAL ANESTHESIA AND ORAL SURGERY FOR CHILDREN
   DR. NORMAN OLSEN
   Associate Professor and Chairman of Department of Pedodontics
   Northwestern University, School of Dentistry

6. ORAL LESIONS
   DR. M. MICHAEL COHEN
   Stomatologist, Boston Floating Hospital, Faculty
   Tufi's University School of Medicine

7. TREATMENT OF FRACTURED PERMANENT ANTERIORS
   DR. JOHN E. GILSTER
   Professor of Pedodontics
   Washington University, School of Dentistry

8. **PATIENT MANAGEMENT**
Dr. Harold K. Addelston
Professor of Pedodontics
New York University, College of Dentistry

9. **PRACTICE MANAGEMENT**
Dr. Laren W. Teutsch
Former Director, Department of Pedodontics
Creighton University, Omaha, Nebraska

10. **PULP THERAPY FOR THE PRIMARY AND YOUNG PERMANENT TOOTH**
Dr. David B. Law
Professor of Pedodontics
University of Washington, School of Dentistry

11. **GENERAL OPERATIVE PROCEDURES FOR CHILDREN**
Dr. Ralph L. Ireland
Dean and Professor of Pedodontics
University of Nebraska, College of Dentistry

12. **PERIODONTAL DISEASES OF CHILDREN**
Dr. Harvans Bhatia
Assistant Professor, Department of Pedodontics
University of Southern California, School of Dentistry

SATURDAY SESSION ONLY

13. **A NEW APPROACH TO CARIES CONTROL**
Dr. Maury Massler
Professor and Head, Department of Pedodontics
University of Illinois, College of Dentistry

14. **AUDIO-VISUAL EDUCATION FOR PARENTS**
Dr. Roy M. Wolff
Member—American Academy of Pedodontics

PANEL DISCUSSION—SUNDAY 2-4 P.M.

"INTERPRETATION AND TREATMENT OF GROWTH PATTERNS IN CHILDREN"

Moderator: Dr. Sidney I. Kohn
Professor of Pedodontics
Fairleigh Dickinson School of Dentistry

Panelists: Dr. Thomas K. Barber
Associate Professor, Department of Pedodontics
University of Illinois, College of Dentistry

Dr. John R. Thompson
Professor and Chairman, Department of Orthodontics
Northwestern University, School of Dentistry, Chicago, Illinois

Dr. Samuel Hemley
Professor of Orthodontics
New York University, College of Dentistry

TABLE CLINICS

1. **JACK L. ANDERSON, D.D.S., Wayzata, Minnesota**
"The Use of Chloral Hydrate in Pedodontics."

2. **MILTON B. ASBELL, D.D.S., M.Sc. (dent.), Camden, New Jersey**
"The Dento-Facial Complex in the Cooley's Anemia Patient."

3. **ROBERT J. BOLLER, D.D.S., Minneapolis, Minnesota**
"Development of the Teeth During the Fetal Period."

4. **MAX L. BRAMER, D.D.S., Chicago, Illinois**
Arnold Steinberg, D.D.S.
"Simplified Radiographic Surveys and Aids in the Treatment of the Handicapped."

5. **ROBERT R. BUCKLEY, M.S., D.D.S., Indianapolis, Indiana**
"Bruxism and Athetosis in Cerebral Palsy."

6. **COLORADO PEDODONTIC STUDY GROUP**

WILLIAM E. CODY, D.D.S.
"The Class III Gold Foil in Young Permanent Anterior Teeth."

JACK M. EISENSON, D.D.S.
"Space Maintenance Involving the Unerupted First Permanent Molar."

WILLIAM P. HUMPHREY, D.D.S.
"Chrome Steel in Dentistry for Children."

KENNETH W. POLLACK, D.D.S.
"Modifications of Hawley Type Retainers."

7. **DEMERITT PEDODONTIC STUDY CLUB, North Carolina**

METT AUSLEY, D.D.S.
"Motivation."

R. B. BARDEN, D.D.S.
"Removable Space Maintainers."

DON BLAND, D.D.S.
"Pulp Therapy."

ZENO EDWARDS, D.D.S.
"Economics."

TOM FLEMING, D.D.S.
"Periodontal Problems."

CHARLES GODWIN, D.D.S.
"Restorative Dentistry."

BILLY HAND, D.D.S.
"Palliative Orthodontics."

DON HENSON, D.D.S.
"Fixed Space Maintainers."

BEN HOUSTON, D.D.S.
"Preventive Dentistry."

JIM LEE, D.D.S.
"Steel Crowns."

LEWIS LEE, D.D.S.
"Fractured Anteriors."

8. **EASTMAN DENTAL DISPENSARY, Rochester, New York**
JOSEPH DI MAGGIO, D.D.S.
STANLEY HANDELMAN, D.M.D.
"Space Regaining."

9. **FAIRLEIGH DICKINSON SCHOOL OF DENTISTRY, Teaneck, New Jersey**
MELVIN BELLET, D.D.S.
"Practical Aids in Operative Dentistry for Children."
ELIAS LISMAN, D.D.S.
"X-Ray Diagnosis and Interpretation in Pedodontics."
WALTER SCHWARTZ, D.D.S.
"Aids in Behavior Management of the Child Patient."

10. **ALBERT GREEN, D.D.S., New York, New York**
MARVIN KING, D.D.S.
"The Office Management of Handicapped Children."

11. **RAYMOND B. KIELICH, D.D.S., Buffalo, New York**
"Improved Tooth Relationship with Simple Appliances."

12. **JAMES B. KING, JR., A.B., D.D.S., Pittsboro, North Carolina**
"Pedodontia for the General Practitioner."

13. **Z. KONIKOW, D.D.S., Royal Oak, Michigan**
"A Practical Approach of Premedication."

14. **SEYMOUR KOSTER, B.A., D.D.S., Port Chester, New York**
"Preventive Orthodontics for the Handicapped Child."

15. **MARVIN KOZLOV, D.D.S., M.S., Chicago, Illinois**
"The Action of Drugs on Amputated Pulps."

16. **THEODORE C. LEVITAS, D.D.S., Atlanta, Georgia**
"Radiology, Radiation and Children."

17. **CHARLES J. MEHLUM, D.D.S., Phoenix, Arizona**
"A Philosophy of Dental Practice."

18. ANDREW E. MICHANOWICZ, B.S., D.D.S., Pittsburgh, Pennsylvania
"What to Do on Traumatically Involved Permanent Anterior Teeth in the Pedodontic Patient."

19. BARRY G. MILLER, D.D.S., M.S., CARLTON V. WINTER, D.D.S., M.S., Charlotte, North Carolina
"The Distal Shoe Appliance."

20. W. NEAL NEWTON, D.D.S., ROGER L. PARROTT, D.D.S., St. Louis, Missouri
"The Cantilever Space Maintainer."

21. RICHARD NAISMITH, D.D.S., Oakland, California
"Group Practice—Why Not?"

22. PAUL D. QUILLMAN, B.S., D.D.S., Chicago, Illinois
"A Demonstration of the Location of Lactobacilli as Related to Caries Activity."

23. GALEN W. QUINN, D.D.S., M.S., Durham, North Carolina
"Significance of Early Occlusion Diagnosis."

24. ARNOLD ROSENBERG, D.D.S., Yonkers, New York
"Diagnosis and Treatment Planning in a Pedodontic Practice."

25. SETON HALL COLLEGE OF MEDICINE AND DENTISTRY, Jersey City, New Jersey
ABRAHAM KOBREN, B.S., M.S., D.D.S.
OVID SLAVIN, A.B., D.D.S.
"Treatment of Traumatic Injuries to the Anterior Teeth of Children."

26. MARVIN SNIDERMAN, D.D.S., Pittsburgh, Pennsylvania
"What Drugs to Prescribe."

27. HOWARD J. TUCKER, D.D.S., Pittsburgh, Pennsylvania
"Pulpal Therapy and Practical Procedures."

28. TUFTS UNIVERSITY SCHOOL OF DENTAL MEDICINE, Boston, Massachusetts

HAROLD BERK, D.D.S.
"The Vital Exposed Fractured Anterior Tooth."

ARNO BOMMER, D.M.D.
"Cavity Preparation in the Primary Teeth."

M. MICHAEL COHEN, D.M.D.
"Oral Lesions in the Young Child."

HELMI FOGELS, D.M.D.
"The Value of Removable Appliances for the Mixed Dentition."

SPENCER FRANKL, D.D.S.
"The Influence of Infected Primary Teeth on the Developing Dentition."

JOHN MACLAUGHLIN, D.M.D.
"Introduction of the Child Patient to Office and Patient Management."

JOHN MEADE, D.M.D.
"Finishing and Polishing Amalgan Restorations."

ADELAIDE O'BRIEN, D.H.
"The Value of Parent Education."

C. ELWOOD PARKER, JR., D.M.D.
"High Speed and the Young Child—an Evaluation of Present Day Cutting Techniques."

MARTIN ROSENGARTEN, D.D.S.
"Local Anesthesia for Children."

FREDERIC SHIERE, D.D.S.
"Cast Space Maintainers—Design and Technique."

ANDREW WESTON, D.M.D.
"The Value of X-Rays in the Treatment, Diagnosis and Case Management of the Primary Dention."

SUMNER WOLFSON, D.M.D.
"Banding and Filling of Primary Teeth."

29. JAMES WHITCOMB RILEY PEDODONTIC STUDY CLUB, Indianapolis, Indiana

FUTHRIE CARR, D.D.S.
"Rubber Dam Technique."

LA FORREST GARNER, D.D.S.
"Regaining Space Due to Mesial Drift."

WILLIAM GILLIG, D.D.S.
"Care of Fractured Permanent Incisors."

DAVID MCCLURE, D.D.S.
"Injection Technique for Children."

JOHN R. MINK, D.D.S.
"Crown and Bridge for the Young Adolescent."

RICHARD NORMAN, D.D.S.
"Dental Materials in Pedodontics."

Scientific Luncheon Participants for A.S.D.C. Convention—Saturday, October 14th

Dr. Harold K. Addelston	Patient Management
Dr. Albert L. Anderson	Fixed and Removable Prostheses for Children
Dr. Leonard Bachman	The Psychological Response of Children to Hospitalization, Anesthesia and Operations
Dr. Thomas K. Barber	Growth and Development of Occlusion
Dr. Harvans Bhatia	Periodontal Diseases of Children
Dr. Harold Berk	Pulp Capping
Dr. M. Michael Cohen	Periodontal Disease in Childhood
Dr. Wayne D. Dunnom	General Anesthesia for Uncooperative Children
Dr. Sidney B. Finn	Removable Appliances in Interceptive Orthodontics
Dr. Francis J. Fleege	Parent Education and Case Presentation
Dr. Mollie D. Foster	The Pulp in Pedodontics
Dr. John E. Gilster	Fractured Incisors
Dr. Samuel D. Harris	Pre-orthodontic Problems and Simple Appliances for Early Interception
Dr. Roland R. Hawes	Is There Such a Thing as Topical Fluoride Therapy?
Dr. Samuel Hemley	Interpretation of Growth Problems in Children
Dr. William P. Humphrey	Full Coverage as a Restorative Therapy in Pedodontics
Dr. Ralph L. Ireland	The Preparation of Cavities and the Insertion of Silver Amalgam Restorations in Children
Dr. Sidney I. Kohn	Early Treatment of Aberrant Growth Patterns in Children
Dr. Hugh M. Kopel	The Sedation of the Apprehensive or Handicapped Child Dental Patient
Dr. Sidney M. Kronfeld	Space Maintenance
Dr. Zalman Konikow	Appointment Book Control
Dr. David B. Law	Pulp Therapy
Dr. Jason M. Lewis	The Relation of the Pedodontist With the Parent and Physician
Dr. Ralph E. McDonald	Practical Dental Caries Control Programs
Dr. Jack Magill	Indications for Early Orthodontic Treatment
Dr. Maury Massler	Oral Habits of Children
Dr. Norman H. Olsen	Local Anesthesia in Pedodontics
Dr. Lyle S. Pettit	Diagnosis for Pedodontic Patients
Dr. Bernard Z. Rabinowitch	Diagnostic Problems
Dr. Samuel Seltzer	Root Canal Therapy for Primary Teeth
Dr. Irving B. Tapper	Treatment of Fractured Anteriors
Dr. Laren W. Teutsch	Audio-visual Concept as Related to Parent Education
Dr. Walter S. Weisz	Caries Prevention for the Individual Patient
Dr. Jack E. Wells	Utilization of Auxiliary Personnel With Pedodontic Patients
Dr. Roy M. Wolff	Practice Administration in Pedodontics
Dr. Arthur W. S. Wood	Anterior and Posterior Cross Bites

A Method of Predicting the Initial Eruptive Pattern of the Mandibular Permanent Anterior Teeth by Radiographic Analysis*

MILTON E. GELLIN, D.D.S.**

Epitome

Parents usually seek the services of a pedodontist for the first time because a child suffers from discomfort, pain, swelling or traumatic injuries in the oral cavity. Another major concern of parents is the initial eruptive positions of the mandibular permanent anterior teeth. This paper attempts to achieve four objectives:

1. Present a method of predicting the initial eruptive pattern of these incisors;

2. Provide a basis for forewarning the parent or allaying his concern about the position of these teeth;

3. Detect crowded teeth that should be supervised in order to determine whether they are leading to malocclusion;

4. Evaluate the spacing of primary teeth and form of the arch.

Survey of the Literature

THE literature on this particular aspect of dental development is extremely scant. In his book, "The Aleut Dentition," Moorrees has reported that, "In young persons, crowding of incisors and canines is often observed, especially . . . after the emergence of the teeth. This crowding is usually relieved to some extent before the second molars penetrate the oral mucosa."[1] Spencer observed similar characteristics when he reported that, "Permanent teeth frequently and apparently normally erupt somewhat rotated or spaced, but these temporary defects are corrected with continued eruption together with other forces, and inherent factors tend to direct the teeth into desirable positions."[2] Salzmann has quoted Baume as stating that the lack of alveolar growth and crowding of teeth may be caused by the genetic pattern of growth of the individual and prenatal and postnatal environmental conditions including the size of the tongue and the type of orodental musculature.[3] Salzmann has quoted Baume further: "Spaced *primary* arches are usually followed by favorably aligned permanent incisors."[3] Moyers, in his recent book, "Handbook of Orthodontics" stated: "The first symptoms of some malocclusions are seen in the eruption of the mandibular incisors. This is a sensitive region which must be carefully supervised if the therapy is to be well timed." He continued, "When normal primary spacing is present, the permanent incisors erupt without crowding and attain good alignment."[4] Cheney has stated, "With regard to *primary* arch expansion to aid permanent incisor alignment; . . . much of the early crowding of lower incisors is relieved by

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** Assistant Clinical Professor in Pedodontics, School of Dentistry, Western Reserve University, Cleveland, Ohio.

the movement of these teeth distally as the *primary* canines and molars exfoliate."[5] However, Lewis and Lehman found that, "Spacing of the *primary* incisors had little relation to the alignment of the permanent incisors."[6]

In a recent article written by Dewel, he emphasized the following observations: ". . . the importance of the lower arch in case analysis and treatment planning should be stressed." "One of the principal clinical symptoms of an authentic Class I serial extraction case is premature loss of the *primary* cuspids. This occurs so frequently that it must have diagnostic significance. Its common association with deficient arches leads to one of two conclusions: either early loss of the cuspids is the cause of the reduction in arch length, or more likely, inadequate development is the cause of early cuspid loss."[7]

Methods and Materials

The study about to be reported included 59 children, 32 females and 27 males. Occlusal radiographs were obtained with the cone of the machine placed just posterior to menton (the lowest point on the midline of the chin) and the central beam directed perpendicular to the film. The ages of the children radiographed ranged from three years, one month to five years, ten months. Clinical photographs of the mouths of these same children were obtained to show the initial eruptive position of the permanent mandibular anterior teeth at ages ranging from six years and five months to nine years and eight months. A Kodak Pony camera and strobe light were used at f22 and 100th of a second. The radiographs were analyzed for the following characteristics (see Figure 1):

1. Spacing or contact of the primary anterior teeth,
2. Form of the arch,
3. Separation of unerupted permanent crowns, degree of apparent overlap, and the apparent contact of the unerupted permanent crowns,
4. Shortest distance from the distoincisal angle of the unerupted permanent central to the mesial surface of the primary cuspid (crown of root),
5. Positioning of the permanent unerupted central incisors,

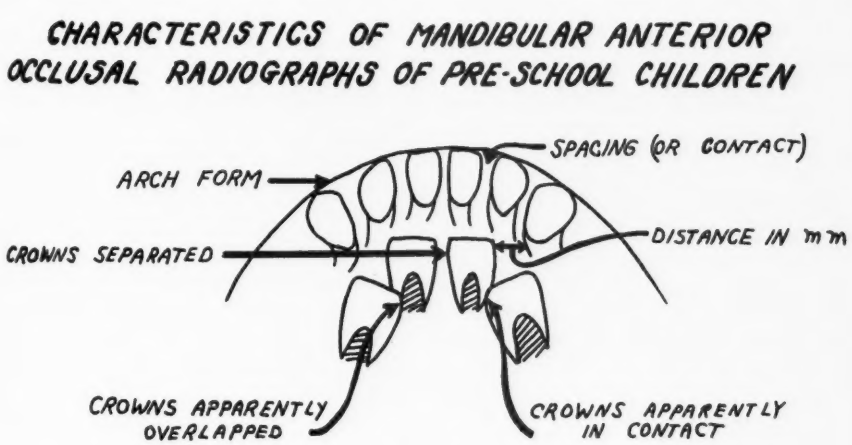

FIGURE 1

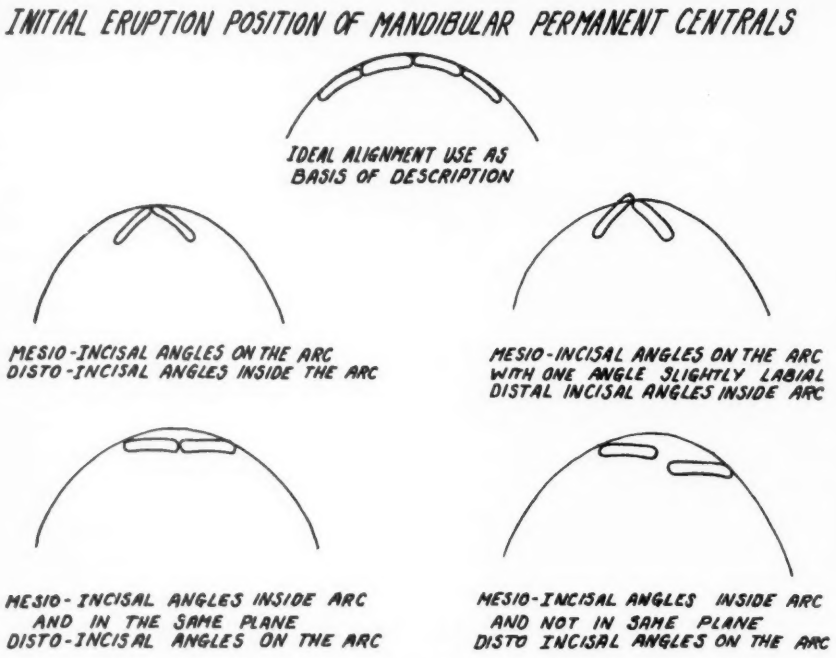
INITIAL ERUPTION POSITION OF MANDIBULAR PERMANENT CENTRALS
IDEAL ALIGNMENT USE AS BASIS OF DESCRIPTION
MESIO-INCISAL ANGLES ON THE ARC DISTO-INCISAL ANGLES INSIDE THE ARC
MESIO-INCISAL ANGLES ON THE ARC WITH ONE ANGLE SLIGHTLY LABIAL DISTAL INCISAL ANGLES INSIDE ARC
MESIO-INCISAL ANGLES INSIDE ARC AND IN THE SAME PLANE DISTO-INCISAL ANGLES ON THE ARC
MESIO-INCISAL ANGLES INSIDE ARC AND NOT IN SAME PLANE DISTO INCISAL ANGLES ON THE ARC

FIGURE 2

6. Positioning of permanent unerupted lateral incisors.

The clinical photographs were analyzed for the following characteristics:

1. Position assumed by the mandibular permanent central incisors,
2. Position assumed by the mandibular permanent lateral incisors,
3. Initial alignment assumed by all four mandibular permanent anterior teeth.

Ideal alignment may be assumed to be present when the labioincisal edges of all four permanent anteriors fall on the arc of a circle. Using this definition as a basis, the permanent central incisors may assume one of five positions (see Figure 2):

1. Ideal alignment;
2. Mesioincisal angles on the arc and distoincisal angles inside the arc;
3. Mesioincisal angles on the arc with one angle slightly labial to the other and distoincisal angles inside the arc;
4. Mesioincisal angles inside the arc and in the same plane, with distoincisal angles on the arc;
5. Mesioincisal angles inside the arc and not in the same plane, with distoincisal angles on the arc.

There are four possible positions assumed by the permanent lateral incisors (see Figure 3): 1. Ideal alignment, 2. Linguoversion, 3. Variable torsiversion, 4. Mixed—one in linguoversion, the other in torsiversion. Obviously, linguoversion and variable torsiversion do not constitute the ideal arc previously defined. The radiographs were compared with the clinical photographs of the respective children. By correlating the characteristics of the radiographs with

the clinical photographs, it became apparent that the children fell into groups. Only one child in the entire series fulfilled the definition of ideal alignment. The remaining children were classified as follows:

1. Crowded anterior teeth predictable—43 children;
2. Lateral incisors unpredictable—13 children;
3. Apparent discrepancies in growth—two children.

These terms will be classified later.

Spacing of the primary anterior teeth was classified as either positive or negative. If spaces occurred between all six primary anterior teeth, the radiograph was positive. If there were contact between the primary anterior teeth, the radiograph was negative. Spacing was positive for 43 children or 72.8 per cent and negative for 16 children or 23.8 per cent.

The form of the arch was classified as either good or poor. Tracing paper was placed over the radiograph of ideal alignment and a line was drawn over the incisal edges of the primary anterior teeth. This area was cut out and used as the standard. By placing the template over each of the other radiographs, the form of arch was determined. Poor form of arch was designated as present if the incisal edges did not fall on a line coinciding with the template. Good form of

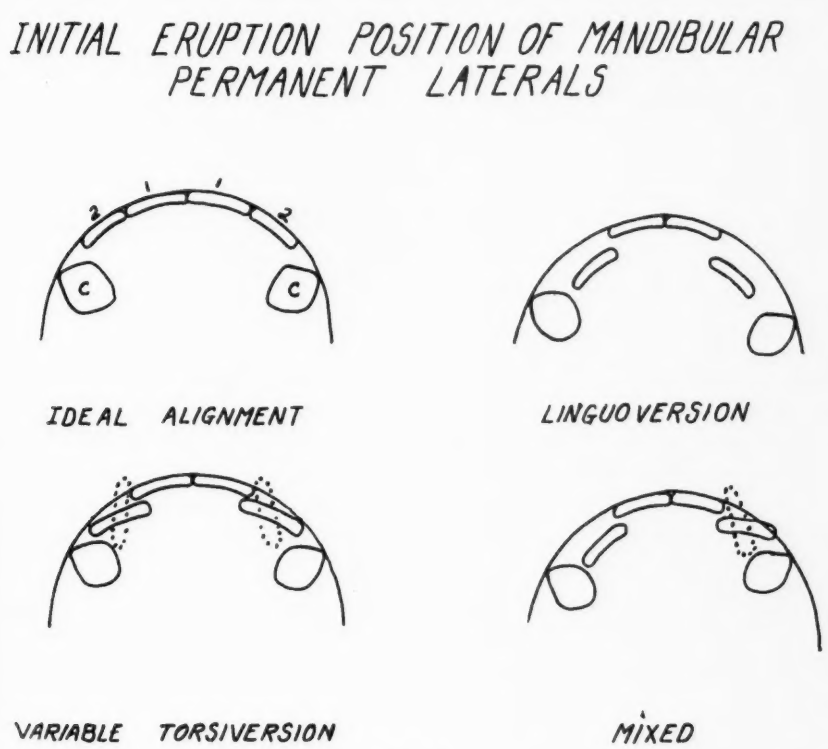

FIGURE 3

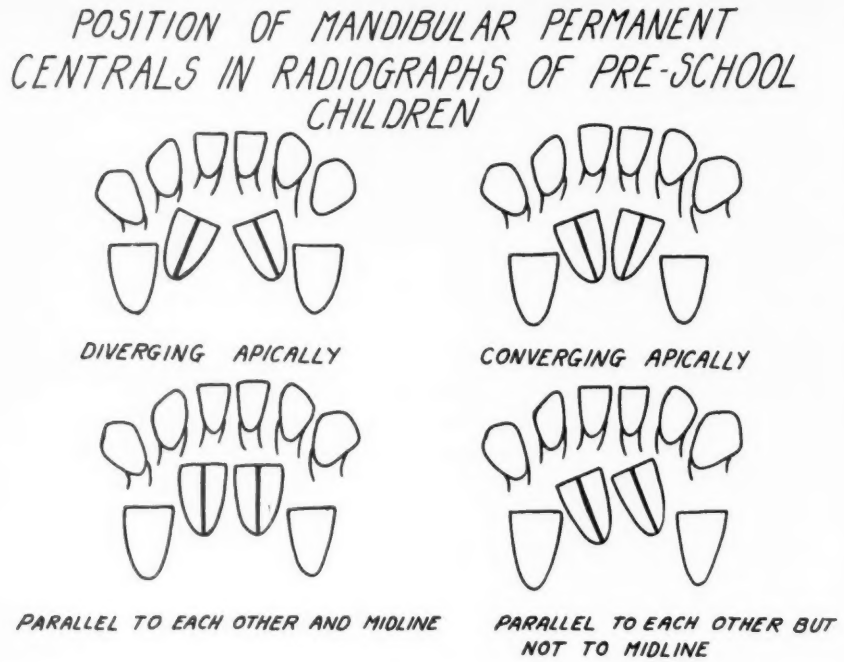
POSITION OF MANDIBULAR PERMANENT CENTRALS IN RADIOGRAPHS OF PRE-SCHOOL CHILDREN
DIVERGING APICALLY
CONVERGING APICALLY
PARALLEL TO EACH OTHER AND MIDLINE
PARALLEL TO EACH OTHER BUT NOT TO MIDLINE

FIGURE 4

arch was designated as present if the incisal edges fell on the line of the template. The form of the arch was good for 53 children or 89.8 per cent and poor for six children or 10.2 per cent.

To describe the positions assumed by the permanent incisors, lines were dropped apically and perpendicular to the incisal edges (see Figure 4). Positional relationships of these lines resulted in the following groupings of the unerupted permanent central incisors:

1. Centrals diverging apically,
2. Centrals converging apically,
3. Centrals parallel to each other and to the midline,
4. Centrals parallel to each other but not to the midline.

The positions assumed by the permanent lateral incisors were derived in the same way as the permanent central incisors and grouped as follows (see Figure 5):

1. Converging apically,
2. Diverging apically,
3. Parallel to each other and to the midline.

Further analysis of the clinical photographs revealed that the initial eruptive alignment depended on whether or not the unerupted lateral incisors were separated from the unerupted central incisors, or apparently overlapped or apparently were in contact (see Figure 1).

Measurements in millimeters were recorded for the shortest distance from the distoincisal angle of the unerupted central incisor to the mesial surface of the primary cuspid crown or root. Both left and right measurements were re-

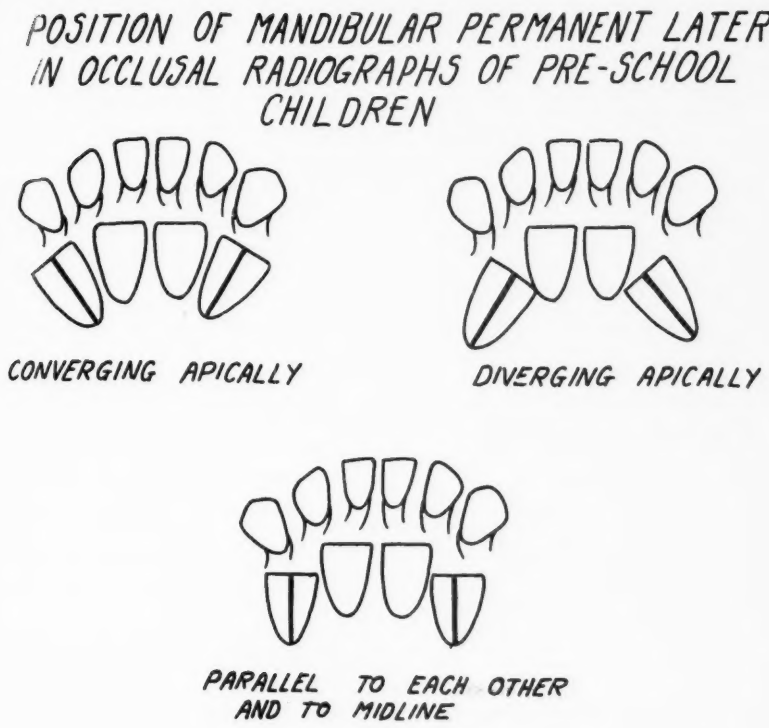
POSITION OF MANDIBULAR PERMANENT LATERALS IN OCCLUSAL RADIOGRAPHS OF PRE-SCHOOL CHILDREN
CONVERGING APICALLY
DIVERGING APICALLY
PARALLEL TO EACH OTHER AND TO MIDLINE

FIGURE 5

corded. A view-box was masked leaving an opening for a radiograph. A head positioner was contrived in order to ensure consistent distance from the eye by stabilizing the forehead. All measurements were made with a Bausch and Lomb Measuring Magnifier calibrated in intervals of 0.1 millimeter.

Results

As previously noted, the clinical pictures of the permanent anteriors were correlated with the radiographs and grouped according to their patterns of eruption. Four groups were specified: ideal alignment, crowded anterior teeth predictable, lateral incisors unpredictable, and apparent discrepancies in growth. In the group classified as crowded anterior teeth predictable, it was possible to predict the eventual eruptive positions of both the central and the lateral incisors. It was impossible to predict which central incisor would be more labial in its position than the other. In the group classified as lateral incisors unpredictable, the positions of the central incisors could be predicted, but the positions of the lateral incisors could not be predicted. The instances of apparent growth-discrepancy showed a premature loss of one or both of the primary cuspids and the permanent lateral incisors almost in contact with the primary first molars.

The clinical photographs presented

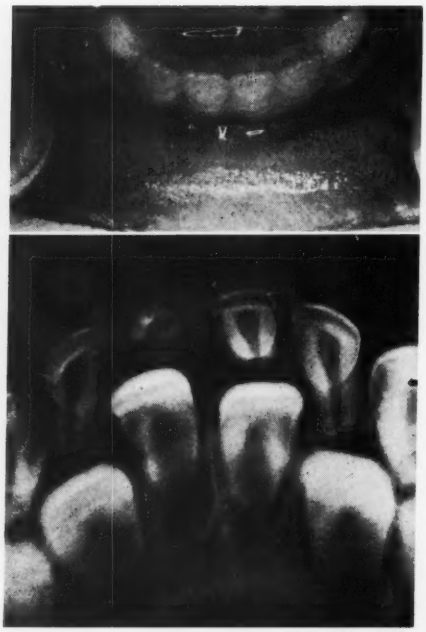

FIGURE 6

illustrate the prediction of the initial eruptive positions of the mandibular anterior teeth. There was one instance which was classified as "ideal alignment" (see Figure 6). In the radiograph the permanent centrals and laterals converged apically. Crowns were separated. The minimal distance from the disto-incisal angle of the the unreputed permanent central incisor to the mesial surface of the primary cuspid was 3.3 mm. on each side. The teeth erupted into good alignment.

Figure 7 presents an example of "crowded anterior teeth predictable." In the radiograph, the permanent centrals converged apically. The right permanent lateral incisor was parallel to the midline and the left permanent lateral incisor diverged slightly. In this group, one or both measurements from the permanent central to the mesial surface of the primary cuspid were less than 3.0 mm. The actual measurement in the radiograph was left 1.4 mm., right 2.8 mm. There was an apparent overlapping of both permanent lateral incisors with the permanent centrals. The clinical photographs showed the typical crowding which occurred in this group.

Figure 8 will serve as an illustration of the group classified as "lateral incisors unpredictable." The radiographs showed the permanent central incisors to be parallel to each other, but not to the midline with the permanent lateral incisors parallel (upper radiograph) or converging apically (lower radiograph). As in the group of "crowded anterior teeth predictable," there was an apparent overlapping or apparent contact of one or both of the unerupted crowns of

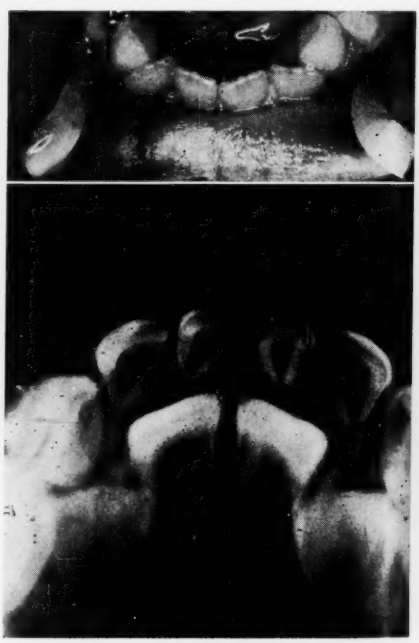

FIGURE 7

the permanent lateral incisors to the unerupted permanent central incisors. The measurements from the permanent central incisor to the surface of the primary cuspid in this category were variable, and there was no consistent relationship. This finding provided one reason why the eruptive positions of the lateral incisors could not be predicted for this group. The clinical photograph showed the typical unpredictable pattern of lateral incisors, and the predictable pattern of central incisors.

Figure 9 demonstrates the group classified as "apparent discrepancy in growth." In the radiograph, the positions of the permanent centrals were found to be converging apically. The minimal distance from the distal surface of the permanent central incisor to the mesial surface of the primary cuspid was 0.3 mm. on the left and 1.8 mm. on the right side. A measurement of less than 2 mm. on one or both sides placed this dentition in the category of "apparent discrepancy in growth." The permanent lateral incisor on the side of the smaller measurement converges apically and is in alignment with the primary cuspid's "displacement position." Premature loss of the primary cuspid will be observed in the clinical photograph.

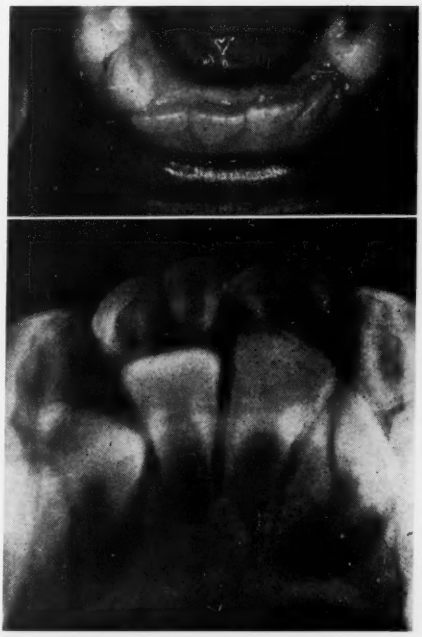

FIGURE 9

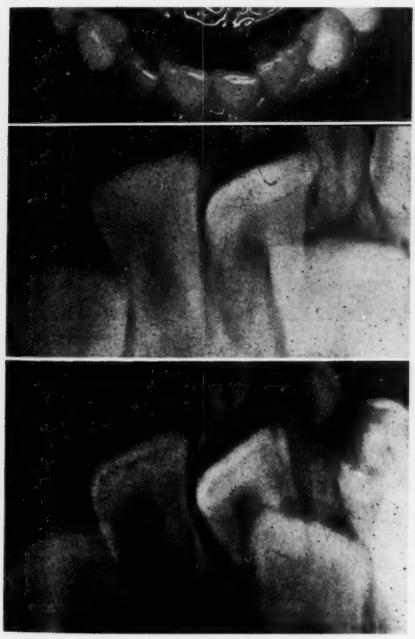

FIGURE 8

Classification of the preschool radiographs into one of the four groups discussed made possible the prediction of the eruptive pattern of the mandibular permanent anterior teeth as a group. It is possible to predict further the eruptive positions of the central incisors as a subgroup and the lateral incisors as a subgroup.

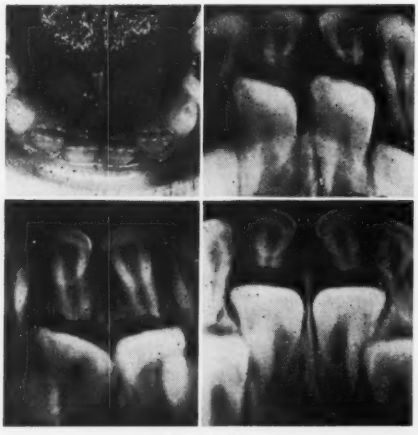

FIGURE 10

Of 31 patients in which the radiographs showed apical convergence of the permanent central incisors, 54 per cent erupted in the same position in the mouth (Figure 7).

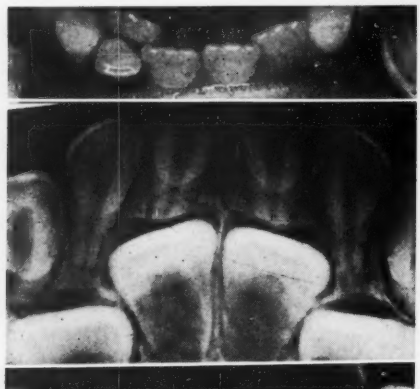

FIGURE 11

Of the 25 patients in which the radiograph showed the central incisors to be parallel to each other and not to the midline (Figure 10, upper right), parallel to each other and to the midline (Figure 10, lower right), or diverging apically (Figure 10, lower left) 88.8 per cent erupted into the same position in the same position in the mouth (Figure 10, upper left is an example).

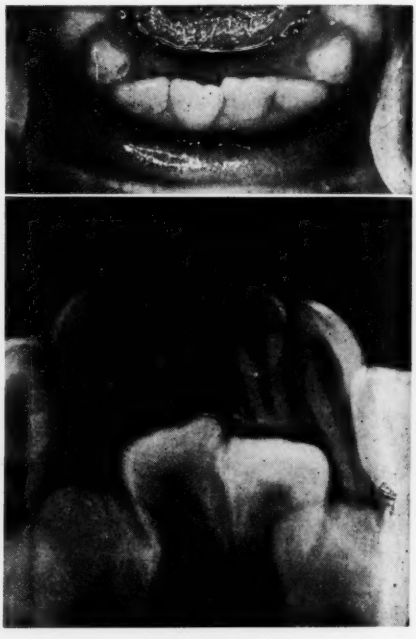

FIGURE 12

If the permanent lateral incisors in the radiograph converge apically (Figure 11, upper radiograph), or if they are parallel to each other and to the midline (Figure 11, lower radiograph), one or both laterals will erupt in linguoversion. Of the 30 patients in which the radiograph showed this condition, 90 per cent of the lateral incisors erupted in one or both in linguoversion as pre-

CLASSIFICATION OF POSITIONS ASSUMED BY THE PERMANENT CENTRALS AND LATERALS IN OCCLUSAL RADIOGRAPHS OF PRE-SCHOOL CHILDREN

	CENTRALS				LATERALS		
	CONVERGING APICALLY	PARALLEL TO MIDLINE	DIVERGING APICALLY	PARALLEL NOT TO MIDLINE	CONVERGING APICALLY	PARALLEL TO MIDLINE	DIVERGING APICALLY
IDEAL ALIGNMENT	T T				T T		
CROWDED ANTERIORS PREDICTABLE - ALL FOUR	T T	T T	T T	T T ONLY WITH LATERALS DIVERGING	T T	T T	T T
CROWDED ANTERIORS UNPREDICTABLE-LATERALS ONLY				T T	T T	T T	
APPARENT GROWTH DISCREPANCIES	T T				T T ONE OR BOTH "DISPLACEMENT POSITION"	T T ONE OR BOTH "DISPLACEMENT POSITION"	

FIGURE 13

dicted (Figure 11, top is an example).

If one or both of the permanent lateral incisors in the radiograph diverge apically, both will erupt in torsiversion with the distoincisal angle labial to the primary cuspid and the mesioincisal angle lingual to the permanent central (Figure 12). Of the 13 children in which the radiograph showed lateral incisors diverging apically, 100 per cent erupted in torsiversion as predicted.

Figure 13 summarizes the positions assumed by the permanent central and lateral incisors in the radiographs. The "T's" represent perpendiculars dropped from the incisal edges of the unerupted permanent anterior teeth. The positions of the "T's" represent positions of the respective teeth in the radiographs. This figure illustrates only two characteristics of the four that are necessary for classification, namely, the positions assumed by the permanent central and lateral incisors in the radiograph. Figure 14 is a representation of all of the factors necessary for classifying a radiograph in order to determine the initial eruptive patterns. The lower two items are the same as Figure 13, but are here shown in the form of a "check list."

Summary

A method has been presented by which the initial pattern of crowding of the mandibular permanent anterior teeth can be predicted from an occlusal preschool radiograph. This radiograph can be used as a diagnostic aid in forewarning the parent of the expected crowding after the initial eruption of the permanent mandibular incisors.

When the radiographs in this study were subjected to the deductive method of analysis it was possible to predict the

DEDUCTIVE METHOD FOR CLASSIFYING OCCLUSAL X-RAYS OF THE PRE- SCHOOL CHILD

			IDEAL ALIGNMENT	CROWDED ANTERIORS: PREDICTABLE	CROWDED ANTERIORS: LATERALS UNPREDICTABLE	APPARENT GROWTH DISCREPANCY
CROWNS SEPARATED			X			
CROWNS APPARENTLY OVERLAPPED CROWNS APPARENTLY IN CONTACT ONE OR BOTH				X	X	+
DISTANCE FROM DISTAL OF PERMANENT CENTRAL TO MESIAL OF PRIMARY CUSPID ROOT	LEFT	RIGHT				
	> 3.3 MM	> 3.3 MM	X			
	< 3.0	< 3.0		X		
	< 3.0	> 3.0		X		
	VARIED	VARIED			X	
	< 3.0	< 3.0				++
POSITION OF PERMANENT CENTRALS	PARALLEL TO EACH OTHER AND TO MIDLINE			X		
	PARALLEL TO EACH OTHER BUT NOT TO MIDLINE			X (ONLY WITH DIVERGING LATERALS)	X	
	CONVERGING APICALLY		X	X		++
	DIVERGING APICALLY			X		
POSITION OF PERMANENT LATERALS	PARALLEL TO EACH OTHER AND TO MIDLINE			X	X	+
	CONVERGING APICALLY		X	X	X	+
	DIVERGING APICALLY			X		
	IN LINE WITH ONE OR BOTH CUSPIDS "DISPLACEMENT POSITION"					+

FIGURE 14

initial eruptive patterns of the mandibular permanent anteriors quite accurately. In 96.6 per cent of the 59 children studied, initial eruption occurred with some malalignment. Of the same children, 72.8 per cent had spacing in the primary dentitions and 89.8 per cent had good form of arch. In the radiographs of 56 instances of "crowded anterior teeth predictable" and "lateral incisors unpredictable," 88 per cent of the permanent central incisors that were parallel or diverging apically erupted parallel and 54.8 per cent of the permanent centrals converging apically erupted converging as evidenced in the clinical photographs. Of the 43 "crowded anterior teeth predictable" 100 per cent of the lateral incisors diverging apically erupted into torsiversion and 90 per cent of the lateral incisors that were converging apically erupted with one or both teeth in linguoversion.

1. Conclusions

1. Occlusal radiographs secured as described can be classified for initial eruptive position of the permanent central and lateral incisors.

2. Certain criteria can be used to predict initial eruptive alignment.

3. The form of the arch and the spacing of the primary dentition do not appear to be important factors in the initial eruptive alignment.

4. Disharmony of size of teeth with deficient length of arch can be predicted at the stage of initial eruption in selected instances.

5. All children will show some degree of malalignment in the initial eruptive position.

6. Parental concern about the initial positions of the mandibular permanent anterior teeth can be alleviated at this stage of dentofacial growth and development.

Acknowledgement

Appreciation is expressed to Dr. Philip Burwasser, Professor and Head of the Department of Pedodontics, School of Dentistry, Western Reserve University, for his supervision and guidance in the preparation of this paper.

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Cleveland, Ohio

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NOTICE

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Please write to Dr. C. F. Tuma, 7701 Fitzwater Rd., Cleveland 41, Ohio, for information.

Pulp Reaction to Commonly Used Capping Materials*

DAVID F. MITCHELL, D.D.S.**

FROM the literature, it is abundantly clear that vital pulps treated by capping, or after curettage, or coronal pulpotomy, can survive many different forms of drug therapy.[1, 2, 12] Yet it is impossible to date, in view of the conflicting findings, to recommend the exclusive use of a single drug or any single technique. The dozens of different agents which have been tried with or without some measure of success range from charcoal, through ivory chips, to sulfa drugs, a variety of antibiotics, and the anti-inflammatory corticoids.[19, 8] Much interest in the past has been shown in calcium hydroxide[7, 6] paraformaldehyde (in earlier years) and formocresol.[5, 10] More recently a mixture of a calcium compound, an antibiotic and corticoid has shown promise.[4] Many proprietary preparations for vital pulp therapy are on the market without having the support of adequate, controlled, experimental evidence of their value.

There are many reasons for the uncertainty expressed above: for example, (1) the difficulty encountered in obtaining sufficient numbers of vital, asymptomatic, primary and permanent teeth for clinical and microscopic study is one restriction; (2) another problem is the exacting technique required for preparing teeth for microscopic study and proper interpretation; e.g. when mechanical exposures have been created experimentally in sound teeth, dentin chips have entered the pulp and new osteodentin deposited around them has been called a reaction to a therapeutic dressing placed over the exposure; (3) still another problem lies in the fact that, as yet, we have no reliable, consistent clinical signs and symptoms which correlate well enough with pulp normality or abnormality, to furnish us with a predictable degree of success in choosing teeth for such experimentation.[16] These factors, and others, contribute to the difficulties which make our present-day analysis of the best agent or agents available for vital pulp therapy difficult.

To circumvent the problem of obtaining large numbers of human teeth for testing purposes, the teeth of dogs, monkeys and rodents have been employed; and when all factors are properly controlled they seem to give reliable indications of what may happen to the human pulp under similar conditions.[3, 5, 9, 11] To avoid the need for decalcification of teeth for microscopic study, we have attempted to develop and use a mass screening technique whereby many different materials can be tested more simply and quickly. Small pellets, or masses of freshly mixed pastes of the various materials are implanted under the skin of rats. The surrounding tissues are then excised at different intervals and the inflammatory reaction is

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judged microscopically after an acute, chronic and reparative period of time.[14] This technique assumes that the subdermal connective tissue inflammatory response is basically similar to that of the dental pulp and most other tissues. Proof of this assumption must await further studies. Meanwhile, we are accumulating information of the *relative* irritant qualities of a great variety of dental materials, including pulp therapeutic agents—see figure 1.

This technic has shown that calcium hydroxide, mixed with water or methyl cellulose, is moderately irritating (on a scale of "mild, moderate or severe")[14] and is somewhat unique in that it induces the formation of heterotopic bone in the capsule surrounding the pellet.[15] The possibility that this osteoid inducing effect is somewhat comparable to the induction of a "calcific barrier" which develops beneath calcium hydroxide in dental pulps is worth noting.

Calcium hydroxide has been studied more than any other pulp capping agent, and it is known to meet with varying degrees of success ranging from 30 to 100 per cent. The reports of one investigator, particularly extensive and well controlled, seem to indicate that it is probably about 70 per cent effective in saving teeth.[17, 18]

On the other hand, a mixture of zinc oxide and eugenol also is known to be an efficient pulp capping agent; however, not as many studies report the development of a "calcific bridge" beneath this material as do those concerned with calcium hydroxide.[6, 8] Zinc oxide and eugenol is a milder irritant than calcium hydroxide, but heterotopic bone formation has not occurred around implants of this material in the dermis of the rat.[13, 14, 15] Although a calcium hydroxide or a zinc oxide and eugenol dressing seems appropriate, many of the proprietary products available which include these two drugs cannot necessarily be recommended until they have been tested further. Too often manufacturers empirically add other products to their dressing, apparently with a sense of hope rather than on the basis of experimental proof that such additions are valuable.

The recommendation to the effect that a tooth inadvertently exposed during an operation, whether it be primary or young permanent, may be capped successfully if it has not demonstrated symptoms of pulpitis previously, often has been made.[12] Herein lies the crux

IRRITATIONAL QUALITIES OF A FEW SELECTED DENTAL MATERIALS
(Rat Tissue Reaction)

Mild	*Moderate*	*Severe*
Zinc oxide and eugenol	Silicate	Copper cement
Fused porcelain	Resin cement	Zinc silicate cement
Silver amalgam	Gutta percha	Copper amalgam
Gold foil and inlay	Calcium hydroxide	Croton oil
Zinc phosphate cement "A"	Zinc phosphate "B"	Zinc phosphate "C"
Pulp capping agent "A"	Pulp capping agent "B"	Pulp capping agent "C"

FIGURE 1. An illustration of the wide range of rat tissue reactions to 18 proprietary dental materials, including some pulp therapy agents. On the basis of this test alone, it is not possible to make recommendations regarding the clinical use of these products.

of the matter; an accurately diagnosed, newly exposed pulp, without pre-existing infection, probably will lend itself to a great variety of pulp capping materials with a good degree of success. On the other hand, if we attempt to cap the pulp of a tooth which is known to have pre-existing infection and inflammation, due to caries or any other cause for chronic pulp exposure, then the prognosis is considerably less favorable. Obviously, we cannot measure the extent of pulpitis in a tooth without removing it for careful study.[16]

If one uses vital pulp therapy, the patient should be warned that the outcome may not be favorable in every instance, and a careful follow-up must be made. This should include electrical, thermal and percussion tests, the study of any symptoms which may arise, and radiographs, for a minimum of two years before such an operation is judged to be a success.

Summary

1. Many studies have been made of pulp capping materials and methods, but the results often are conflicting. Many more materials are available commercially which have not been carefully tested.

2. Many difficulties in the preparation for study of human and animal teeth are encountered in testing such agents.

3. The promise of a screening method in the rat dermis has been demonstrated, and the need for correlation of the findings with clinical studies of the human pulp is noted.

4. Calcium hydroxide mixed with water or methylcellulose is recommended, as is zinc oxide and eugenol, for vital pulp therapy.

5. The importance of an accurate diagnosis and careful selection of cases was stressed. It may be that a healthy pulp can be capped successfully with many different materials. But the infected, inflamed pulp is definitely a liability for such a procedure.

6. The importance of a careful, long term follow-up, including electrical, thermal and percussion tests, radiographs and history cannot be overemphasized.

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Caries Incidence Among Cerebral Palsy Children: A Preliminary Study

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I. PURPOSE

THE primary purpose of this study was to make a survey of incidence of dental caries in a group of children with cerebral palsy; secondarily, an attempt was made to relate caries incidence to cerebral palsy and associated conditions.

II. METHODS OF PROCEDURE

Eighty-one patients with cerebral palsy and associated conditions, between three and fifteen years of age, were examined at two cerebral palsy facilities. Seventy-three patients were seen at the Columbia Presbyterian Medical Center and eight were seen at the St. Giles Home for the Crippled in Garden City, New York. The patients at the Columbia Presbyterian Medical Center were outpatients examined in the Pediatric Cerebral Palsy Clinic at Vanderbilt Clinic and in the Cerebral Palsy Dental Clinic of the Columbia University School of Dental and Oral Surgery. The St. Giles Home is an in-patient facility for severely involved cerebral palsy patients.

All patients were examined with mouth mirror and explorer. Because of the limited number of available patients, it was necessary to examine patients over a wide age range. For children with only the primary dentition the decayed, extracted, and filled (def) system was used; for children with only permanent teeth the decayed, missing, and filled (DMF) system was used; for children with a mixed dentition a combination of the two systems (def and DMF) was used. A careful attempt was made to be sure that normally exfoliated primary teeth were not considered in the def rate.

To determine the type of cerebral palsy, degree of impairment, and degree of mental retardation (if any), medical charts were consulted at both the Columbia Presbyterian and St. Giles hospitals.

For additional interest, the total number of teeth, oral hygiene, gingival conditions and type of occlusion were noted in addition to the charting of the def-DMF teeth of each child.

The total number of teeth and the total number of diseased teeth were counted, and a percentile rating was obtained by dividing the number of diseased teeth by the total number of teeth. It was felt that this rating would best correlate the DMF teeth and the total number of teeth, especially in children of the mixed dentition stage where primary teeth were normally exfoliated and their permanent successors had not yet erupted. The total study group was also broken down into sub-groups by age, type of cerebral palsy, and mental retardation. Yearly age groups extended from 3.5 to 15.5 years.

The types of cerebral palsy categorized were: spastic quadriplegia, hemiplegia, athetoid, ataxia, mixed, and

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miscellaneous; included in the miscellaneous groups were children with cerebral palsy symptoms and concurrent neurological involvements as well as children with cerebral palsy symptoms and questionable diagnoses.

III. OBSERVATIONS

Of the 1,830 teeth observed, 527, or 28.8 per cent were affected. There was a steady increase in incidence of dental caries with age except for significant drops at eight years and twelve to thirteen years (Figure 1).

The groups of cerebral palsy types (spastic quadriplegia, hemiplegia, etc.) presented a range of dental disease from 20.1 per cent to 30.2 per cent. The group with mental retardation exhibited 33.6 per cent of affected teeth as opposed to 27 per cent in the non-retarded group.

Of the children examined 82.7 per cent examined presented normal, healthy gingiva; 12.3 per cent showed marginal inflammation and 4.9 per cent had gingival hypertrophy due to dilatin sodium.

The oral hygiene was good or fair in 75.2 per cent of the patients, while 24.7 per cent showed poor oral hygiene.

Normal occlusion was found in 41.9 per cent of the patients examined, while malocclusions were observed in 58.1 per cent.

Age Group	*Mean No. Teeth*	*Mean No. DMF Teeth*	*Per Cent*
3.5- 4.5	19.4	.6	3.09
4.5- 5.5	19.9	2.5	12.56
5.5- 6.5	19.0	4.0	21.05
6.5- 7.5	22.1	7.4	33.48
7.5- 8.5	23.2	4.8	20.69
8.5- 9.5	22.8	8.2	35.88
9.5-10.5	22.3	7.9	35.4
10.5-11.5	25.4	10.6	41.7
11.5-12.5	25.8	7.6	29.72
12.5-13.5	25.7	6.0	23.3
13.5-14.5	25.1	10.9	43.42
14.5-15.5	28.3	11.0	38.87

FIGURE 1

IV. DISCUSSION

An attempt was made to correlate the mean number of def-DMF teeth of so-called normal children with those of the cerebral palsy children studied; for this purpose, the study of Philadelphia school children by Cohen and Massler[1] was used (Figure 2).

Age	*"Normal" DMF Teeth*	*C.P. DMF Teeth*
6	3.17	4.0
7	4.23	7.4
8	5.0	4.8
9	5.3	8.2
10	4.8	7.9
11	4.5	10.6
12	5.6	7.6
13	6.0	6.0
14	8.1	10.9
15	8.2	11.0

FIGURE 2

It is felt that the decreases in per cent of dental caries at the eight to nine and twelve to thirteen year age levels was to be expected for the following reasons. At eight years of age, the percentile rating was decreased due to a decrease of the def number without a change in the DMF number. The exfoliation of the diseased anterior primary teeth lowered the def number, while the DMF number remained unchanged because the permanent successors of these anterior teeth were either unerupted or too recently erupted for caries attack. Similarly, at twelve to thirteen years of age, the exfoliation of the diseased pri-

mary molars and cuspids lowered the def number while their permanent successors were either unerupted or too newly erupted to change the DMF number.

The sub-groups of cerebral palsy types exhibited relatively the same percentage incidence. The athetoid group was disregarded because of the insufficient number of patients, while the miscellaneous group was not considered because of questionable diagnosis of cerebral palsy. Therefore, this comparison was limited to spastic quadriplegia, hemiplegia, ataxia, and mixed.

Caries incidence for the mentally retarded group was somewhat higher than for the non-retarded group, but the 6.6 per cent difference is not enough to be statistically significant.

Gingival conditions were normal in 82.7 per cent of the cases examined; of the remaining patients, 4.9 per cent had inflammation and hypertrophy due to the administration of dilatin sodium for the control of seizures.

While good home care was observed in 53 per cent of the patients seen, 47 per cent had poor or fair oral hygiene; the majority of these was seen in the older children (over ten years of age).

No correlation was demonstrated between malocclusion and type of cerebral palsy.

V. CONCLUSIONS

1. A group of children with cerebral palsy showed a more erratic distribution of mean DMF rates than a group of "normal" average school children.

2. The average caries incidence rate for this entire group of children with cerebral palsy was 28.8 per cent.

3. The decrease in percentage of dental caries at certain ages is understandable due to the exfoliation of certain carious primary teeth and the eruption of new permanent teeth.

4. The different types of cerebral palsy show little variation from the average for the entire group.

5. The group of mentally retarded children in this group showed a higher caries rate than the non-retarded group; this is not statistically significant in this small number of cases.

6. A continuation of this study is contemplated and is considered necessary for more complete statistical significance, especially with references to a group of so-called norms.

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Pain and Patient Control Methods in Pedodontics*

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CHILDREN respond to kindness, sincerity and honesty. All children are different from the first month of life with temperaments ranging from docile acceptance to rebellious tantrums. Most acts of poor rapport between dentist and child come from a lack of patience and tolerance on the part of the dentist.

Basically, there is really no such thing as a bad pediatric dental patient. What is lacking is the education of the child patient to the dental environment and his acceptance of dental treatment in a pleasant frame of mind. One third of dental pediatric patients suffer from fear. These fears in most cases have been gruesome tales of dental procedures related by adults or neighborhood children. In some cases this fear is valid due to an unpleasant experience by the child himself in a dental office. Children free from fear of pain will always respond to reason. Successful management of an apprehensive child is only accomplished when both the psychologic and the physiologic blocks in the dental child relationship have been overcome. If a child does not have confidence because the dentist has not fulfilled his word concerning as aspect of dental treatment, he becomes distrustful, frightened and unmanageable. Fear that arises in the first dental visit is fear of the unknown. Parental guidance and influence can do much toward curbing many of the so-called bad dental experiences. Each child is an entity within himself; therefore, the relationship of the dentist with the child during the first visit is of tremendous importance.

A child who feels secure will have few fears and will have confidence in people. There will be no preconceived prejudice for this youngster entering the dental office. He should be prepared intelligently for his visits, and any explanations should be honestly expressed in terms the child understands. Avoidance of words like "pain, hurt, or fear" is extremely important. A parent should not show any anxiety in the presence of the child, since this is readily observed.

Since fears sometimes become phobias, a reassuring matter-of-fact confidence should be developed in the child through love and understanding, plus wise discipline which supplies the comfort of authority. Parents who are inconsistent, untruthful and weak undermine the child's respect for them and hence the feeling of insecurity. If he is confidently and firmly escorted to an experienced dentist who likes children and handles them easily, the youngster can enjoy the new experience. He will be proud of his accomplishment and look forward to future visits. Management, therefore, of the child may be simple and need nothing spectacular to produce a pleasant dentist-child relationship.

One of the greatest assets to the management of young children has been the use of local anesthesia for dental treatment. The use of local anesthesia and the application of a rubber dam will prepare most patients for any type of dentistry and one devoid of pain. A competent operator in a well-equipped office, approaching the child with confidence, can use local anesthesia successfully.

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It is imperative that a topical anesthetic be used prior to the insertion of the needle. The success of the topical anesthetic depends on the length of time one waits before injecting the local anesthetic into the tissues. A sharp needle and slow disbursement of the solution will reduce pain from the injection itself.

The child should be told what to expect when the anesthetic works so as to prevent fear of any strange sensation. A child patient not properly prepared for dental treatment can make a seemingly easy operation become a difficult and tedious one.

Unfortunately, most of the children who become dental problems are those who have had dental work done without an anesthetic. The dentist who does not utilize an anesthetic on a young child is not being fair to this patient or preparing him properly for his future dental years. It is also a poor policy to wait until cavity preparation becomes painful before giving a child local anesthesia. Local anesthesia when used will eliminate all experience of pain, cavity preparation and filling becomes more exact and considerable time and energy is saved on the part of the dentist. In addition, the patient is more cooperative and relaxed.

There are some patients who require more specialized treatment to overcome previous traumatic experiences. The use of premedication will enhance and reinforce psychological treatment when minor behavior problems exist, especially in the emotionally disturbed child. Unfortunately, drug medication is little understood or is misused on the part of the dentist. In most cases he will not administer the proper amount because of his own lack of knowledge and fear of the use of these medications.

The reduction of apprehension through premedication makes the difference between a cooperative and a noncooperative patient. The practitioner in his evaluation of the patient must take into consideration the patient, the drugs to be used, and the drug dosage. One must understand that today we cannot be governed by Young's rule, Clark's rule and the like for children. We must realize that in treating children we are not treating a stepped-down version of the adult. These are two separate entities and should be treated as such.

The use of drugs will be influenced by the child's total physiology as well as environmental factors. What is suitable in an individual's home or in a physician's office is not always the case in a dental environment. For this reason, the physiology of the child must be considered above the pharmacology of the drug used.

The response of the child to drugs and the excitement of the moment determines much in the way of success or failure with premedication. The response to the influence of the adrenal gland will forecast accurately the outcome of the premedication used on the child. The greater the excitement, the more the output of adrenalin and noradrenalin. This response will lower the threshold of pain level in the child with the resultant loss of the medication and the subsequent discomfort on the part of the patient.

Energy metabolism, central and autonomic nervous system activity, temperature control, responses of the cardiovascular, respiratory, gastrointestinal and endocrine systems help control the child's reaction to medication and anes-

thesia. The rate of metabolic activity or oxygen consumption sets the pattern for many of the child's reactions to everyday life. The response to various stimuli influences the child. The oxygen requirement of a child governs the basal metabolic energy of the individual. Fever and muscular activity will increase this metabolic rate and require the child to consume more oxygen, thereby requiring more of the medication used. This is the basic concept behind all premedication. The more apprehensive a child becomes, the less chance there is for successful medication unless there is an understanding of drug dosage.

Drugs should be used in combination for the best results, and one should never expect one drug to do the job of another. A hypnotic will never accomplish the work of a narcotic and vice versa. Combination of drugs produces a synergistic effect and gives more relaxation on the part of the patient. The addition of a belladonna derivative will help overcome the "fight or flight" mechanism of the brain.

Children require greater amounts of drugs per pound of body weight than do adults. Practitioners fail to consider that children must go through normal growth patterns which will influence the degree of medication. The ages of 2 to 10 years demonstrate the greatest advances in body growth. From 10 to 15 years, the various systems of the body such as the skeletal, muscular, circulatory, respiratory and the like have an opportunity of catching up with each other. The excited child is one of the most trying problems to handle with a maximum degree of success. The child's psyche must be understood in the fields of medication and anesthesia.

It is important in drug dosage that one establish a fact-finding visit dosage for each individual. This phase in reality means that the dentist is determining for each patient his own respective dose. A dose should be of sufficient strength to raise the threshold level of pain, reduce the incidence of patients "climbing walls," carry the patient through a minimum excitement period and finally control the over-all actions of the child patient. This is determined at the first visit of actual work. Maximum effectiveness of all drugs occurs from 45 minutes to an hour following administration. This is the ideal time for the dentist to initiate his work. Drugs may be administered by one of three methods: Orally, intramuscularly and rectally. The advantages of the intramuscular method of administration far surpasses any of the others.

Certain general rules for drug administration should be carried out:

1. Medication should never be given unless accompanied by an adult.
2. Strict supervision of the patient receiving the medication should be done in the office.
3. Dentistry should not be performed until a reasonable time has passed for the drug to work.
4. Parents should always watch the child during and following the administration of the drugs.
5. A quiet environment is extremely important for the success of the medication.
6. Vital reflexes such as swallowing are never obliterated or impaired under supervised medication.
7. Drugs should never be given during acute illness.
8. Parents should be informed of postoperative rules.
9. The dentist should be familiar with any side effects of the medication.
10. Emergency medication should be available at all times.

Premedication when used to reduce apprehension will produce successful results as well as educate patients for

dental procedures. Personalities will change for the better following supervised medication.

Rules laid down by the dentist for both child and parent will enhance the success of the medication preoperatively, during the actual procedures and postoperatively.

The last method of treatment to reduce or control pain in pediatric patients is through the use of a general anesthetic. This is a wonderful technique if used properly, in the right hands, and in the right situation. Too often the promiscuous use of general anesthesia becomes a crutch in the hands of many practitioners who fail to fulfill their obligation in patient management by utilizing this technique when it is not indicated. However, when the occasion presents itself, the dentist has the opportunity of doing a real service to the traumatized patient who has been pushed from pillar to post and has developed innumerable fears and complexes regarding dental care.

Entire personalities have changed for the better following the use of general anesthesia for dental procedures. Emotional and mental problems are helped and in many instances overcome following this technique where other procedures have failed.

Today with the rapid advance in the field of anesthesiology, pediatric anesthesia has assumed a truly great role. Optimum working conditions are now present with a minimum amount of risk.

It is important that both child and parent be prepared psychologically to face the experience of hospitalization for general anesthesia. Modern methods of anesthesia can provide the child both safe and pleasant sleep for his needed operation.

The existence of respiratory infection at the time of the anticipated surgery presents severe problems in the induction and maintenance of the anesthesia as well as in the post-anesthetic period. Frequent coughing and profuse secretions prolong the induction period and increase the incidence of postoperative pulmonary complications. Post-anesthesia laryngeal croup may occur more frequently during a period of respiratory infection. Therefore, two to three weeks should be allowed between the subsidence of respiratory symptoms and the induction of general anesthesia.

It is important that once the child is admitted to the hospital, the anesthesiologist should visit him to survey the physical status to determine the best agent for the child. The psychologic make-up of the child will help determine the selection and dose of the preoperative drugs. This is extremely important in children. It has been shown that children who have terrifying experiences in the operating room can develop disabling psychologic symptoms such as night terrors, enuresis and temper tantrums. Fortunately, there is a wide variety of drugs which can provide sedation in children. The drug should permit the child to be taken to the operating room moderately asleep; it should permit induction of anesthesia with the child completely unaware of the time interval between leaving his bed and returning to it. The proper medication should balance these aims against the physical status of the child, the choice of anesthetic agent and technique, the skill of the anesthesiologist and the facilities available for the

pre-operative and postoperative care of the patient.

In patients studied at Children's Hospital of Philadelphia, the Anesthesia Department found that combinations of pentobarbital, morphine and scopolamine best met the aims of pre-operative sedation in children over 15 pounds who are in excellent condition.

Assuming that the patient has the correct hemoglobin count, is in good physical condition and has been medicated correctly, the induction of the anesthesia is the next thing to be accomplished. Children tolerate inhalation methods of induction better than intravenous methods. All children dislike the needle puncture and in addition this disrupts the pre-operative sedation.

It is far better to use non-explosive agents when thinking in terms of rehabilitating the mouths of children dentally. Nitrous oxide, a most useful induction agent, should always be administered with at least 20 per cent oxygen. Trichlorethylene vapor can be combined with Nitrous oxide to reinforce anesthetic induction. Recently, Halothane has been introduced as a potent non-explosive anesthetic. Although great accuracy is required when using this new agent, it is more potent than other non-explosive agents. Concentrations should not be above 3 per cent as circulatory side effects occur rapidly.

The use of muscle relaxant drugs is most valuable and holds a definite place in the management of certain situations. The use of these drugs presumes the use of an endotracheal tube. Children seem to tolerate succinylcholine very nicely. This can be given either intravenously or intramuscularly.

The use of the endotracheal tube is a powerful aid in allowing safe, efficient dental procedures. In over 1,200 patients at the Children's Hospital of Philadephia undergoing various surgical procedures, only 6 per cent had any complications. The majority of these were minimal, ranging from hoarseness to respiratory stridor. No patients required a tracheotomy.

Monitoring is a definite must in anesthesia, and means something that serves to remind or give warning. All the traditional parameters such as pulse, circulatory heart beat, blood pressure, skin color, skin turgor, plus physiologic data presented electrically should be utilized. It is now practical to record during anesthesia the electrocardiogram, electroencephalogram, the direct arterial blood pressure, blood oximetry and carbon dioxide content of alveolar air. This information is displayed on an oscilloscope or on a sheet of paper or even translated into sound. When working on children, one cannot help but observe the capriciousness of changes in the child's respiration, depth of anesthesia, blood pressure, pulse and general condition as compared to an adult. Careful observation during the recovery period following a general anesthetic is as important and vital as the actual surgical procedure. Trained personnel with drugs and equipment readily available can treat the sudden respiratory obstruction or circulatory collapse which can befall the patient post-operatively.

The use of general anesthesia, only where indicated, utilizing all the newer methods and techniques, will give the dentist an opportunity to produce the finest in service to the child patient as well as create a patient well-adjusted to

dentistry for the remainder of his lifetime.

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The Fluoride Dilemma for Public Health Educators in Preventive Dentistry

DEWARD K. GRISSOM, Ed.D., F.A.P.H.A.*

THE public health educator is frequently called upon to assist professional and lay citizen groups in planning for better community health programs. One of his basic functions is to plan with the group a sound approach to understanding the topic or problem under consideration. The soundness of the approach is in part determined by efforts devoted to assist the group in seeking scientific facts about the problem. Herein lies the dilemma for the health educator in the field of preventive dental health based on the use of fluoride salts. No other scientific discovery in recent years has created so many problems for the health educator as has the discovery of the use of fluoride salts in preventing dental caries.

Lay and professional committees all over the United States for the last few years have been considering whether or not their own public water supplies should be fluoridated. Many communities have added fluorides to the public water supplies, and many others have refused to do so. Some communities have repeatedly refused to fluoridate the water supply and then suddenly decide to do so. Other communities have had fluoridation and then discontinued the program. In each instance the health educator must assume that the local citizenry acted in what they felt to be in the best interest of their community. The question is why such wide differences in community action when supposedly the same factual information is available to all communities? One answer is that there are many confusing issues, other than the fact that fluorides used properly do reduce caries, involved in the broad area of the use of fluoride salts in preventive dentistry.

The public health educator is not so naive as to suppose that community action is always based on scientific facts; but his goal remains to get as much action based on facts as is possible. But in the field of the use of fluorides in preventive dentistry, many individual practicing dentists do not subscribe to the factual data which are accepted by their own local, state, and national professional groups. Whenever one of these dentists is on a local fluoridation committee or is in attendance at a public meeting, it is difficult for the health educator to present pertinent factual data. It is unfortunately true in too many instances, that when local dentists who favor fluoridation have passed a resolution in the local society, they fail to follow up by attending public meetings on the topic. It is far more common for the individual dentist who objects to be present at the meeting. When this does occur the meeting is generally devoted to "factual" side issues.

For example, it has been well documented that adding fluorides to public drinking water supplies has resulted in 65 per cent less dental caries experiences in the child population when consumed

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from the date of birth than would otherwise occur.[1, 2, 3] But it has been further documented that when less than the prescribed concentration of one part per million is present in the drinking water, some protection, though less than the optimum amount, occurs.[4] Many individual practicing dentists and lay leaders continue to object to fluoridating public water supplies because optimum protection may or may not be afforded. Those objecting to the use of fluorides in the drinking water quote from studies indicating that there are considerable fluctuations in concentration at the point of consumption in presently approved fluoridating devices.[5] It does little good to argue that even though optimum concentrations are not maintained, some benefits do occur.

Another question usually raised is how much or how little water must one consume to receive the recommended amounts of fluorides for optimum protection? The answer is about one quart per day in areas where the one part per million fluoride concentration is maintained. But once again it is known that in some communities where weather conditions are conducive to drinking large amounts of water the concentration is decreased and where weather conditions are conducive to drinking small amounts of water the concentration is increased. Here the objectors insert questions about those who drink little or much water. Then, too, one is frequently asked how about children who do not consume water but other beverages. For example, some children consume milk, fruit juice, and other liquids to the near exclusion of drinking water. Of course, these children do not get the required amounts of fluoride salts to receive optimum protection.

Unfortunately, these exceptions to the general rule are frequently so thoroughly aired at group meetings that the general overall benefits to be gained from fluoridation of public water supplies by the majority of the people are either ignored, or seemingly lose much of their powers of persuasion in the group, probably because every individual likes to feel that he is an exception to the general rule.

Within the last five years pharmaceutical companies have produced inexpensive tablets and liquid forms of fluoride salts that can be taken just as vitamins or cod liver oil preparations are taken. These preparations would seem to be the answer to the problem of securing optimum protection for those children who drink liquids other than water. And, more important still, they do offer a possible way for parents who live outside water fluoridated areas to secure optimum protection from caries for their children if they choose to do so.[6] Toothpastes containing fluorides still require topical applications with fluorides to give optimum protection.[7]

The American Dental Association has approved the use of fluoride tablets and solutions for preventing dental caries.[8] However, it is pointed out in the JOURNAL article, approving this form of systemic use of fluoride salts, that getting parents to adhere to a strict dosage schedule over a long period of time might prove to be most difficult. Even though this precautionary statement has provided ammunition for the guns of the objectors to the use of fluorides in preventive dentistry, this particular problem is not strikingly different than the dozens of similar problems public health personnel have met with considerable success for many years in the

maternal and child health programs with respect to nutrition, immunizations, and so on.

In the face of all difficulties, tremendous gains have been made in public water fluoridation and prescription programs for preventive dentistry in the last few years. Equal success will undoubtedly be made in getting prescription fluorides used systemically in areas where water fluoridation is impractical or non-existent for one reason or another. Approximately one-fourth of the population in the United States presently received protection from caries through fluoridated public water supplies. This leaves three-fourths without such protection. Generally speaking these will be more difficult to reach than the first one-fourth, but the task can be accomplished. Recent research conducted by the author and others indicates that almost 30 per cent of practicing dentists already prescribe fluorides in one form or another for their patients living outside water fluoridated areas.[9]

It would seem that from the nature of the problem, health educators should:

1. Study continuously all the literature available to keep abreast of new information;

2. Work closely with local, state, and national dental societies as well as with individual local dentists and enlist the personal aid of those dentists who favor fluoridation;

3. Enlist the aid of parents, local lay leaders and civic groups;

4. Enlist the aid of allied professional groups such as pediatricians, nurses, and other health department personnel;

5. Keep constantly aware of the role that other factors such as diet and proper dental care play in maintaining good dental health;

6. Keep up a continuous flow of information through mass communication media regarding the uses of fluorides and other measures used in preventive dentistry.

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Abstracts

Alteration of Human Consciousness by Nitrous Oxide as Assessed by Electroencephalography and Psychological Tests—J. R. Henrie, M.D., J. Parkhouse, M.D., R. G. Bickford, M.B., Anesthesiology, Vol. 22, No. 2, p. 247-59, March-April 1961.

This is one of the most significant articles to be written on a phase of Nitrous Oxide anesthesia little understood by the majority of practitioners administering this gaseous agent.

The authors carried this study out on 18 normal subjects who were subjected to an impairment of consciousness for 10 minutes by breathing 30 per cent nitrous oxide. The results were evaluated by (1) retention tests, (2) introspective reports, and (3) the EEG. The verbal and visual retention tests consisted of a meaningful short story taken from the Wechsler Memory Scale. The subject heard the story, repeated it, and a record of his recall was checked. For every story, a multiple choice test of questions was prepared containing key words from the story and others not listed in the story. Design pairs and strips were used as well as tests prepared by Milton and Malmo. Introspective records consisted of reporting definite experiences while breathing the gas. The EEG tests were made reclining on a bed following the tests. Signals were to be reproduced by the subjects on telegraph keys. The verbal and visual retention tests in this experiment showed marked impairment between performances of the group when breathing air and when breathing gas. Variations in the responses to Nitrous Oxide were marked. The introspective psychic effects of Nitrous Oxide reflected the subjects impaired perception of their environment as well as temperamental instabilities. Delayed recall was minimally impaired.

A study such as this is important to the dental practitioner because it gives not only an insight as to what is happening to the patient at the other end of the mask, but also the serious consequences that improper proportions of a gaseous agent with oxygen can have on the mental makeup of the patient under simple procedures of short duration.

M. M. Album

Preparing Children for Anesthesia and Surgery—Robert M. Smith, M.D., American Journal Dis. of Child., Vol. 101, No. 5, p. 650-653, May, 1960.

This excellent article should be a prerequisite for the dentist interested in the use of anesthesia for children. Dr. Robert M. Smith is one of the pioneers in pediatric anesthesia, and his concern for the child is understanding.

The article stresses the importance of controlling the emotions and fears of the child as well as to put him in the best physical condition for the procedures of anesthesia and surgery. These two aims can conflict, the author states, unless they are carefully balanced.

Admission to the hospital should be planned to provide adequate time for the complete preparation of the child without tiring and confusing him. Personnel and surroundings should be that of a cheerful environment. One should take nothing for granted as the history may reveal unexpected pitfalls such as sensitivity to penicillin or previous anesthesia experiences. The anesthetist should visit the patient at least once before the operation. Preoperative orders should be written restricting oral intake at midnight and prescribing suitable preoperative medication. A combination of atropine, pentobarbital sodium and morphine serves these children well. During the induction phase of anesthesia, much time can be lost if it proves to be an upsetting experience. The better the rapport with a child, the less there will be the need to rely upon sedative drugs.

With hyperexcitable children, admission to the hospital the day prior to the oper-

ation serves for better orientation. A bedtime sedative is definitely advised for nervous children. Since these children are physically strong, the author suggests relying on considerable heavy sedation. In preparing the child, one should be certain not to overlook additional defects that might influence the anesthesia.

The article is well written and should help decrease the confusion one can sometimes associate with the hospitalization of children.

MANUEL M. ALBUM, D.D.S.

AN ANESTHESIOLOGIST'S VIEW OF GENERAL ANESTHESIA FOR DENTAL PROCEDURES—Norman J. Gengler, M.D., Chief, Section of Anesthesiology, St. Francis Hospital, Evanston, Ill.

The role of the Anesthesiologist in today's treatment of dental patients is primarily concerned with providing the dentist the opportunity to work on all pateints under the most ideal conditions. The dentist of today is able to work on the large majority of patients without the need of general anesthesia. It is the small minority of patients that will not or cannot cooperate with the dentist that requires general anesthesia. This group of patients consists mainly of the very young, the mental defectives, and the emotionally disturbed.

The use of general anesthesia in dentistry requires the same precautions and safeguards as general anesthesia for general surgery. Many people develop a misconception and believe that general anesthesia for a dental procedure is a very simple thing. The idea that "a small dose of 'Pentothal' will suffice" often leads to many problems. Actually, general anesthesia for a dental procedure can be very difficult because of the intimacy of the oral cavity and the airway. The ability to obtain and maintain an adequate airway is a prime requisite for a person attempting to give general anesthesia for any type of operative procedure. The person giving a general anesthetic should have complete control over this airway at all times regardless of the length of the procedure, be it three minutes or three hours.

When one talks of anesthetic techniques for general anesthesia for dental procedures one cannot be dogmatic and say that there is only one good technique. Actually the technique by which a patient is anesthetized should depend on the experience and ability of the person administering the anesthetic. This is not a task for the untrained or the novice.

Other factors that should prohibit the use of general anesthesia for dental procedures are improper or inadequate equipment and inadequate operating space. The small space contained in most dental offices is not adequate for any type of general anesthesia. The equipment that is required includes a workable anesthetic machine, a good suction machine, and the instruments and drugs necessary to combat any untoward reactions of the patient during anesthesia. To start a general anesthetic with anything less is subjecting the patient to a very great and unnecessary risk.

The ideal arrangement for general anesthesia in a dental procedure is to have a dental unit in a general hospital. With such an arrangement, experienced personnel will be available to assist with all phases of the procedure. The Anesthesiologist and the dentist will each have all the equipment necessary to provide the best of care to the patient. There is a very denite need for general anesthesia in dental procedures, and many patients can be given the dental care which they so sorely need. However, at no time should any procedure be used which will jeopardize the safety of the patient.

Submitted by AUBREY M. LAUTERSTEIN

Book Review

OCCLUSAL EQUILIBRATION AND TEMPOROMANDIBULAR JOINT DYSFUNCTION, by Nathan Allen Shore, D.D.S., Philadelphia, J. B. Lippincott Co., 323 pages, 242 illustrations, $12.50.

This book gives a sound, informative discussion of two major problems that confront the practicing dentist. Occlusal equilibration and temporomandibular joint dysfunction have often been treated in one or two chapters in textbooks on periodontics or oral surgery. This, however, is the first full-length book devoted to these subjects and their relationship to all aspects of dentistry. The book provides a most complete discussion of the cause and effect of the degeneration of the stomatognathic system.

"Because it embodies the establishment of physiologic function, occlusal equilibration should be the final treatment of all cases of occlusal disharmony, regardless of their origin. The operator may be dealing with temporomandibular joint dysfunction, arthrosis, periodontics, crown and bridgework, or a simple occlusal amalgam, but his last procedure must be the correction of any existing pathologic occlusion."

The recording of centric relation is a most important procedure. Dr. Shore gives step-by-step directions for recording centric relation. He gives complete instructions for locating interfering contact surfaces in opposing teeth, for deciding which tooth to reshape, for reshaping the teeth, and for observing certain precautions.

There is also a complete discussion on equilibration of the occlusion in centric relation, in eccentric ranges of occlusion, in malposed teeth and abnormal arch segments.

This is a well-written, well-illustrated, well-indexed book, and can be very useful to all dental practitioners. It is highly recommended for all those interested in occlusal equilibration and temporomandibular joint dysfunction.

MARVIN SNIDERMAN

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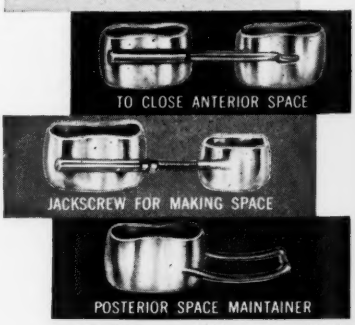

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